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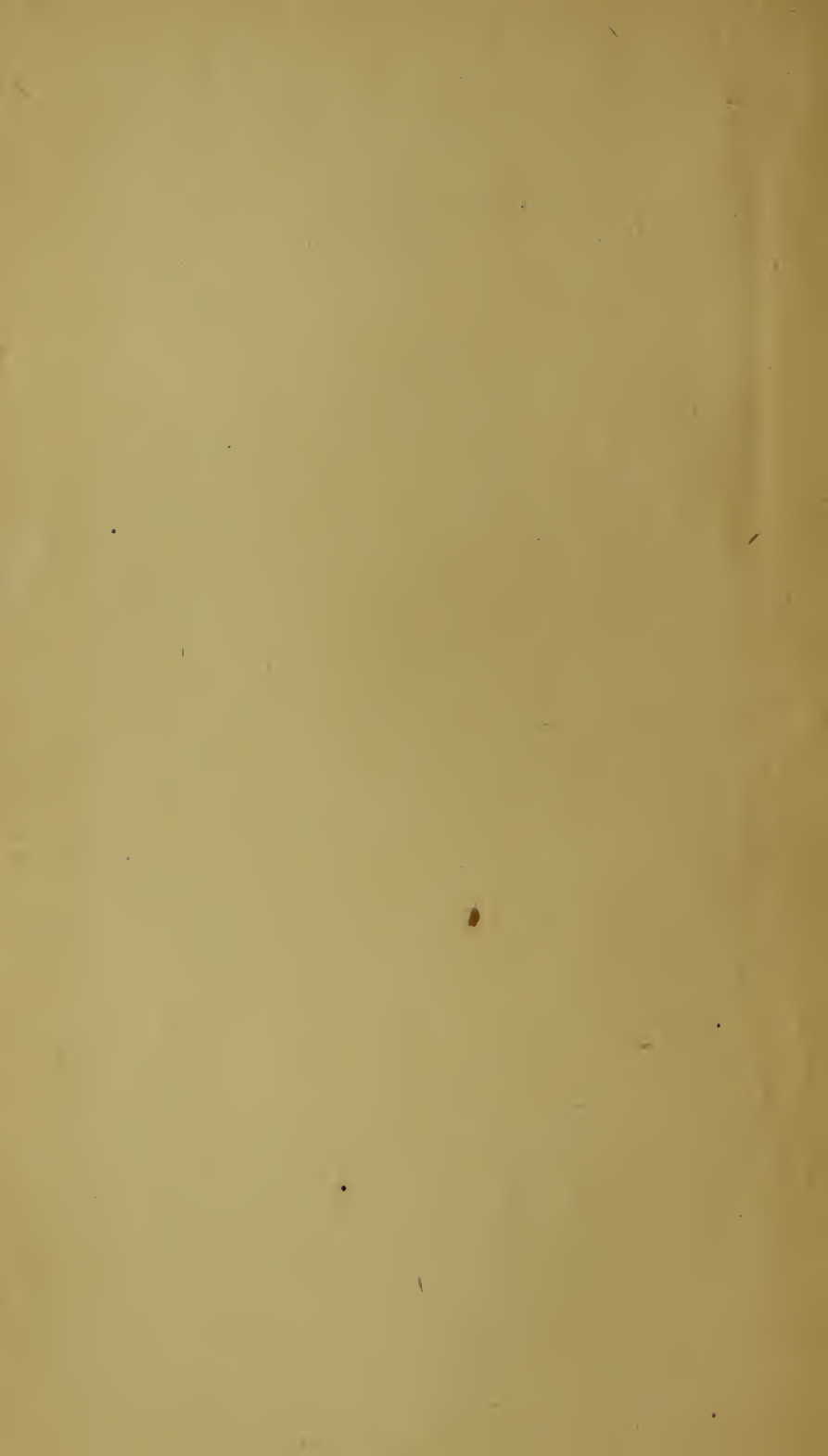
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THE ANNUAL REPORT OF THE SCHOOLHOUSE DEPARTMENT

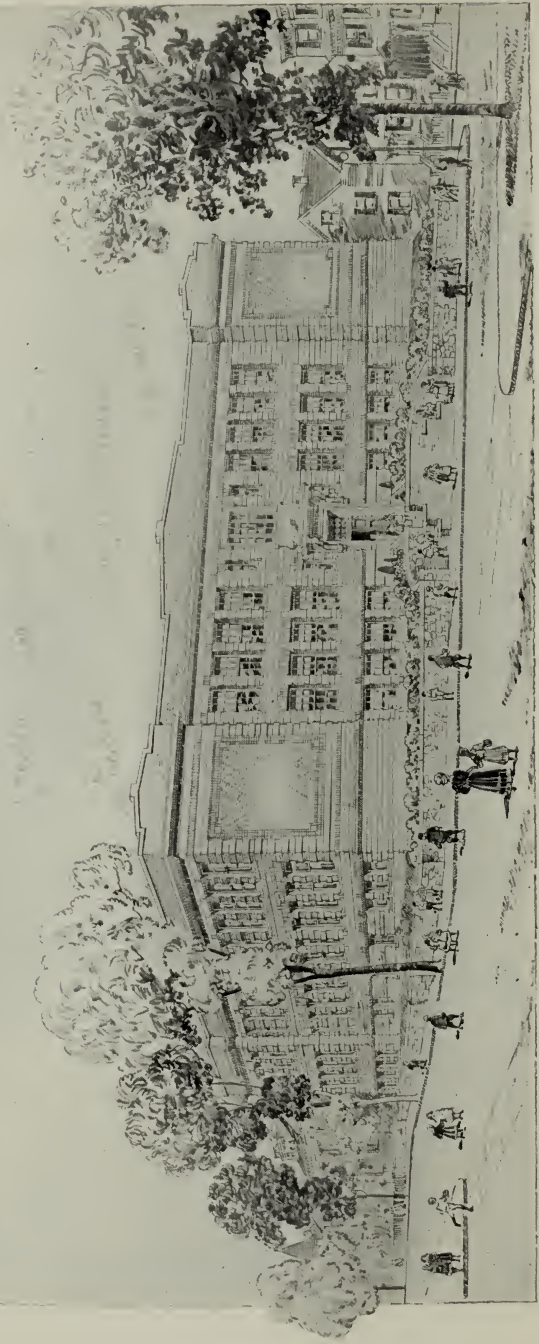
FROM FEBRUARY 1, 1912, TO
FEBRUARY 1, 1913



CITY OF BOSTON
PRINTING DEPARTMENT
1913

CITY OF BOSTON
SCHOOL HOUSE DEPARTMENT.
ELEMENTARY SCHOOL LOWLY GRADE.
EMERSON DISTRICT EAST BOSTON.

EDWARD C. HILLMAN, ARTIST.
75 TRENTON STREET
BOSTON, MASS.



THE ANNUAL REPORT OF THE SCHOOLHOUSE DEPARTMENT

FROM FEBRUARY 1, 1912, TO
FEBRUARY 1, 1913



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CONTENTS.

REPORT OF THE COMMISSIONERS.

	PAGE
I. General Statement	1
II. Work Executed under Appropriation, Land and Buildings for Schools	3
(1.) Report of Progress on Buildings Described Last Year, and New Buildings Undertaken since then	3
(2.) Future Accommodation	12
(3.) Fire Protection	13
III. Repairs	14
IV. Conclusion	16

APPENDICES.

I. Appropriation for Land and Buildings for Schools	20
II. Appropriations for Repairs, Rentals, etc.	28
III. Appropriation for High School of Commerce and School Administration Building	39
IV. Hired Buildings	40
V. Table Showing Cost of Building, Cost per Cubic Foot, Children Accommodated and Cost per Pupil	44
VI. Architects' Services	50
VII. General Information as to Standard Requirements, Elementary Schools	53
High Schools	66
VIII. New Buildings, Bond Issue	80
New Buildings, Tax Levy Appropriation	83
IX. Report of Architectural Division	89
X. Experiments on Humidifying Air at the Oliver Wendell Holmes School	90
XI. Report of Electrical Division	98
XII. Sheet of General Details, Inside Finish, Elementary Schools.	
XIII. Sheet of Plumbing Details.	
XIV. Sheet of General Details, Inside Finish, High Schools.	
XV. Descriptive Schedule of Permanent Buildings.	

ILLUSTRATIONS.

Emerson District School	Frontispiece
Lewis School	Between pages 2 and 3
Assembly Hall	" 2 and 3
Germantown School, Addition to	" 4 and 5
Floor Plan	" 4 and 5
Ellen H. Richards School	" 6 and 7
Roxbury High School Annex	" 8 and 9
William Bradford School	" 10 and 11
Prince School, Addition to	" 12 and 13
Assembly Hall	" 12 and 13
Benedict Fenwick School	" 14 and 15
Ulysses S. Grant School	" 16 and 17
Assembly Hall	" 16 and 17
Public Latin School, Addition to	" 80 and 81
Franklin District School	" 82 and 83
Floor Plan	" 82 and 83
Longfellow District School	" 84 and 85
Floor Plan	" 84 and 85
Charles Sumner District School	" 84 and 85
Floor Plan	" 84 and 85
Oliver Wendell Holmes School:	
Second Floor Plan	" 90 and 91
Basement Plan	" 90 and 91
Humidifying Apparatus	" 90 and 91
Temperature and Humidity Readings,	" 91 and 95
Record of Boiler Pressure	" 96 and 97
South Boston High School	" 100 and 101

BUILDINGS IN CHARGE OF SCHOOLHOUSE DEPARTMENT.

Number of Permanent School Buildings	256
Of the above there are in use as Storehouses, etc.	3
Number of Portable Buildings	105
Number of Hired Buildings	30
Giving Class-rooms to the Number of	63
Parcels of Land Hired	1
Portables on the above, giving Class-rooms to the Number of	1
Number of New Buildings Finished by Commission	47
Number of Buildings under Construction at the Present Time	9

ANNUAL REPORT
OF THE
SCHOOLHOUSE DEPARTMENT

FOR THE YEAR ENDING JANUARY 31, 1913.

HON. JOHN F. FITZGERALD,
Mayor of the City of Boston:

DEAR SIR,— In accordance with provisions of chapter 473 of the Acts of 1901, the Board of Schoolhouse Commissioners submits herewith its eleventh annual report, covering the period from February 1, 1912, to February 1, 1913.

I.

GENERAL STATEMENT.

As outlined in our last report, the Board located the site for the High School of Commerce in the Fenway, which received the approval of your Honor, the School Committee and the Park Commissioners. On the completion of the plans for the above school by the architects the Board advertised for bids, but was prevented from awarding the contract on account of litigation—the abutters of said site seeking a restraining order from the courts to prevent the city and its officials from erecting the building in the Fenway.

The matter was taken before the Supreme Court of Massachusetts and the decision was: "The city can build the High School of Commerce on the Fenway, but cannot build the administration portion of the building there." As the act called for the erection of a building to contain both the High School of Commerce and Administration Building, the Board was unable to proceed with the work.

Later, at a joint meeting of the School Committee and the Schoolhouse Commission, held at the Mayor's office and presided over by your Honor, it was unanimously agreed to have the Corporation Counsel prepare and submit a bill to the Legislature eliminating the administration portion of the building and also the provision in the original bill giving the School Committee equal authority with the Schoolhouse Commission in the selection of the site of said building. The bill is now before the Legislature and the whole matter is in abeyance until some action is taken by that body.

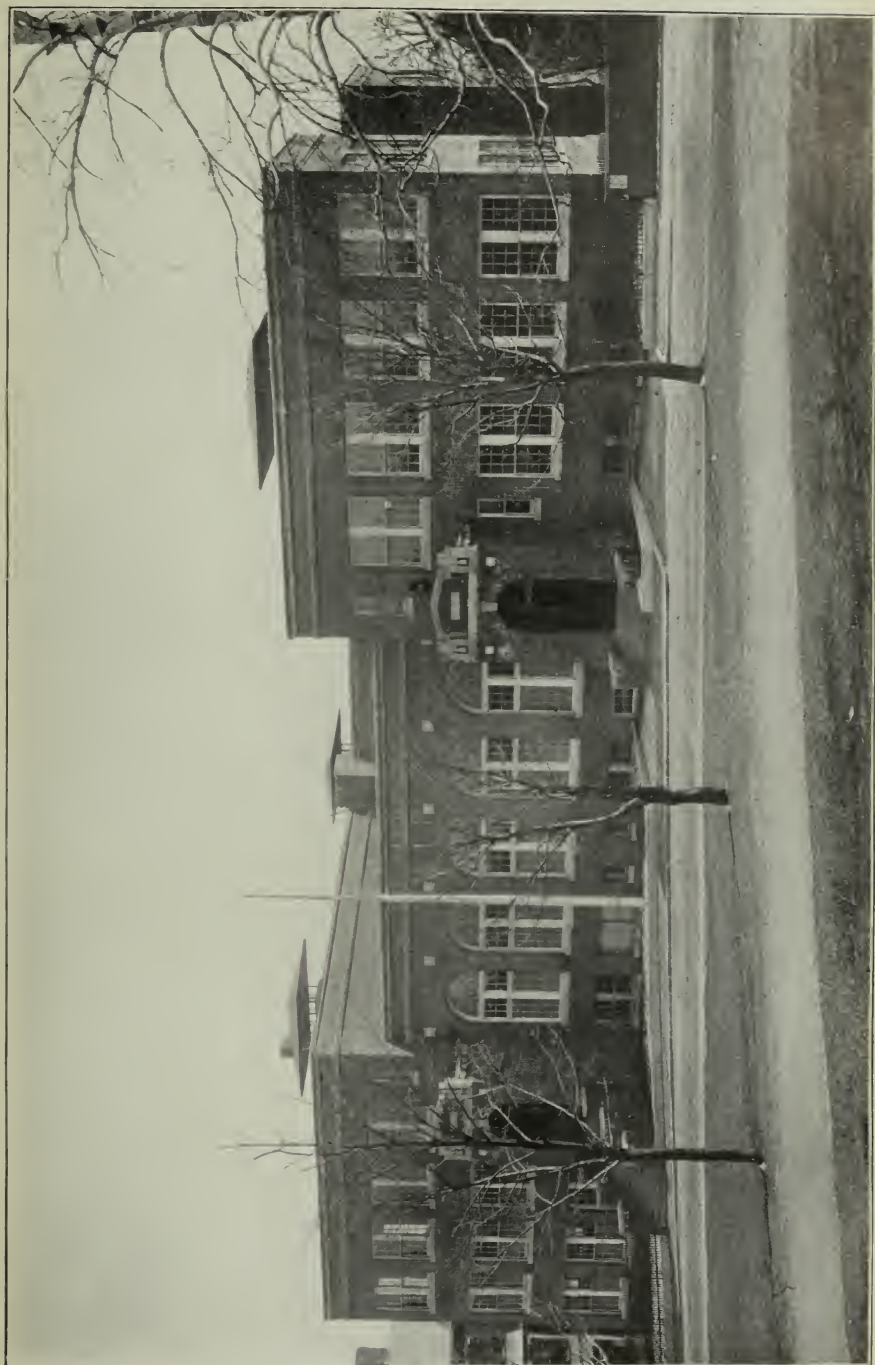
The contract for the High School of Practical Arts was awarded in the month of June, and the Board anticipates having it ready for occupancy at the opening of the schools in September.

During the past year there has been a great deal of discussion by ventilating engineers and doctors regarding the present method of heating and ventilating schoolhouses. The Board has been represented at several of these meetings and as a result of the discussion feels that while the present method may not be ideal in every respect it knows of nothing better, and is disposed to continue the present system until something more effective is found.

The Board, during the past year, authorized its engineer to make some experiments toward the humidification of the air in the class rooms, and the results are given in a special report of our heating and ventilating engineer, which will be found in another portion of this report.

The list of buildings completed during the past year is as follows:

Ellen H. Richards School, Benedict Fenwick School, William Bradford School, Lewis School, Germantown School, U. S. Grant School, Roxbury High School Addition, Prince School Addition.



LEWIS SCHOOL, PAULDING STREET, ROXBURY.



ASSEMBLY HALL, LEWIS SCHOOL.
H. H. Atwood, Architect.

II.

WORK EXECUTED UNDER THE APPROPRIATION
FOR LAND AND BUILDINGS FOR SCHOOLS.(1.) REPORT OF PROGRESS ON BUILDINGS DESCRIBED
LAST YEAR AND ON NEW WORK UNDERTAKEN
SINCE THEN.

Of the School Committee's list for 1907-08 the Board reports as follows:

Item 5.—Prince District (Mechanic Arts High School). The equipment of the building has been finished and the account closed. There has been expended this year the sum of \$1,057.58, leaving a balance of \$3,000, which was transferred to the Boston Industrial School for Boys, Tax Levy Appropriation, 1911.

Item 6.—Phillips District, elementary school (Peter Faneuil School). This account remains open, owing to the fact that a portion of the site is yet to be paid for, the matter being in litigation.

All the items of the School Committee's list for 1908-09 have been completed, and a report made last year.

Of the School Committee's list for the year 1909-10 (Bond Issue) the Board reports as follows:

Item 13.—Lyman District, elementary school, upper grades (Ulysses S. Grant School). (This is Item 2 of the School Committee's list for 1910-11.) This building was completed and occupied on May 13, 1912.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$112,000 00</u>	<u>\$116,372 04</u>

Item 4.—Lewis District, Roxbury, elementary school, upper grades. This building was completed and occupied on March 4, 1913.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$108,173 00</u>	<u>\$108,090 29</u>

Of the School Committee's list for 1911-12 (Bond Issue) the Board reports as follows:

Item 1.—Dearborn District, High School of Practical Arts. The original appropriation on this item was \$335,000. Later \$30,000 was transferred to the Normal School, enlargement of

yard. This contract was signed on June 7, 1912, and will be completed about the first of September, 1913.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$286,786 00</u>	<u>\$293,382 50</u>

Item 2.—Lewis District, Annex to Roxbury High School. After this work was started the Superintendent of Public Schools and the master thought the building should be enlarged by adding an additional story. The matter was brought to the attention of the School Committee, and an additional amount of \$14,000 was transferred from Item 2, Dudley District, Roxbury, High School for Boys, Tax Levy Appropriation, 1912, to put another story on the building. This work was completed and the building occupied October 21, 1912.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$54,545 00</u>	<u>\$79,767 95</u>

This completes the Bond Issue list for 1911-12.

On the School Committee's list for 1911-12, Tax Levy Appropriation, the Board respectfully reports the following:

Item 1.—Henry L. Pierce District, Dorchester, elementary school, lower grades. The contract for this work was signed on March 28, 1912, the work completed and the building occupied on January 20, 1913.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$47,084 00</u>	<u>\$44,589 76</u>

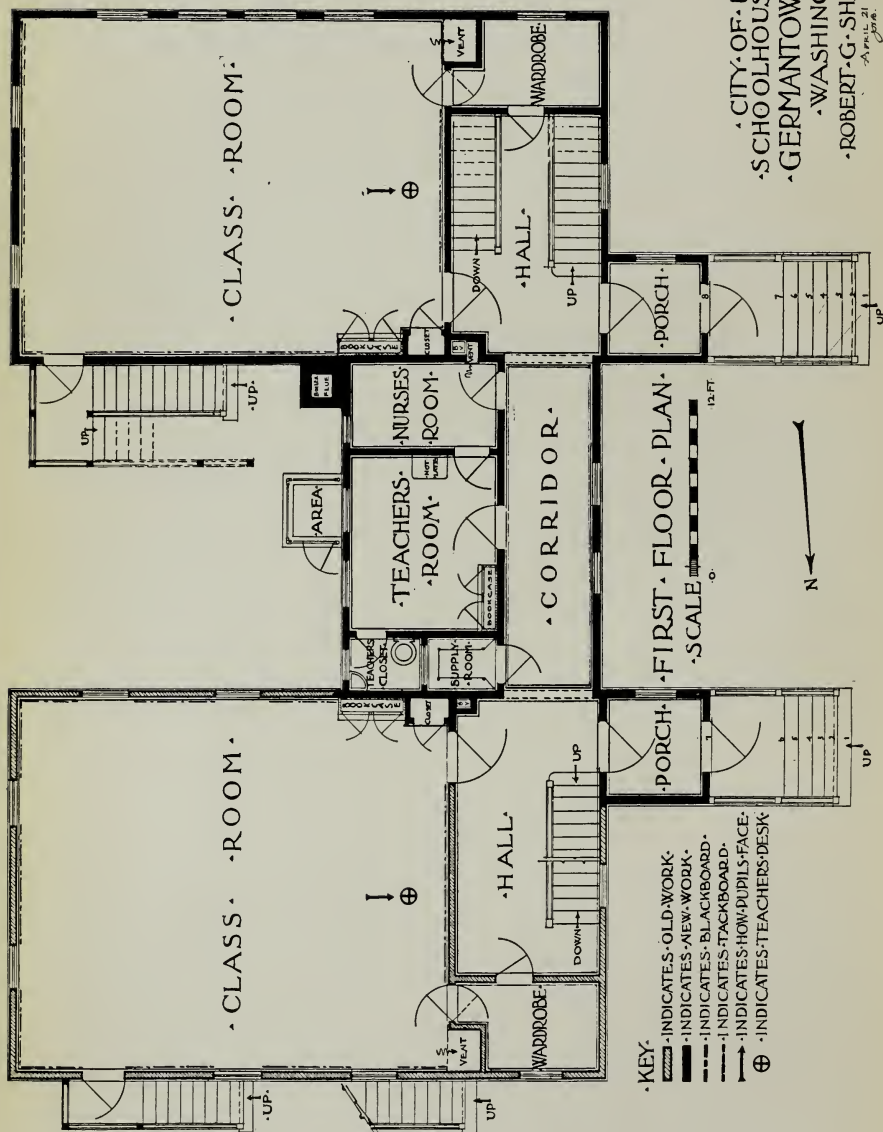
Item 2.—Roger Wolcott District, Dorchester, elementary school, lower grades. This work was completed and the building occupied at the opening of school in September.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$41,575 00</u>	<u>\$42,714 04</u>

Item 3.—Robert G. Shaw District, West Roxbury, elementary school, lower grades, land and building, \$10,000. With this appropriation the Board intended to add two rooms to the existing building, but the lot on which the building stood was unsuitable and the Board decided to secure a lot on the opposite corner of the street which was very much better. An additional sum of \$4,500 was transferred from the Tax Levy Appropriation, 1911, Item 12, extension of Tyler Street School yard, and the sum of \$3,000 transferred from Tax Levy Appropriation, 1912, Item 2, High School for Boys. The land was purchased,



ADDITION TO GERMANTOWN SCHOOL, GERMANTOWN.



• CITY OF BOSTON •
 • SCHOOLHOUSE-DEPARTMENT •
 • GERMANTOWN • SCHOOL •
 • WASHINGTON • ST. •
 • ROBERT • G. • SHAW • DISTRICT •

APRIL 21 1910
 C. M. B.

the old building was moved to the new location and an addition of two rooms made, making it a four-room building. This work was completed and the building occupied on October 22, 1912.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$15,607 00</u>	<u>\$15,253 22</u>

Items 4, 5, 6, 7, 8 were reported on last year.

Item 9.—Phillips Brooks District, Dorchester, elementary school, lower grades, land and building, \$70,000. This work was completed and the building occupied on September 11, 1912.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$63,947 00</u>	<u>\$62,881 45</u>

Item 10.—Edward Everett District, Dorchester, extension of school yard, \$5,500. This item was reported on last year.

Item 11.—Quincy District, city proper, extension of school yard, \$12,000. When last year's report was submitted only one lot had been purchased. The remaining lot has since been acquired for the sum of \$6,516.39, and the yard has been put in condition for use.

Item 12.—Abraham Lincoln District, city proper, extension of school yard, Tyler Street Schoolhouse, \$4,500. The Board found this amount insufficient to purchase the land requested by the Superintendent, and this amount was transferred to the Tax Levy Appropriation, 1911, Item 3, Robert G. Shaw District, elementary school, lower grades, land and building.

Item 13.—Abraham Lincoln District, city proper, Brimmer Schoolhouse, extension of school yard, and equipment of Trade School for Boys, \$22,000. This work was completed and the building occupied March 18, 1912.

	Original Contracts.	Contracts to Date.
General contract	\$9,968 00	\$11,530 96
Electrical contract	3,778 00	4,274 00
	<u>\$13,746 00</u>	<u>\$15,804 96</u>

Item 14.—Harvard District, Charlestown, extension of school yard of Harvard Hill Schoolhouse, \$6,000. This item was reported on last year. After spending \$5,000 for the parcel of land adjoining the above school the balance was used in preparing the yard for use.

Item 15.—Agassiz District, West Roxbury, enlarging West Roxbury High School building, \$12,000. This item was reported on last year.

Item 16.—*Martin District*, Roxbury, enlarging Normal School yard, \$43,500. The sum of \$30,000 was appropriated from the High School of Practical Arts, for the time being, making a total of \$73,500, and the amount paid for the land was \$73,127.22.

Item 17.—*Bennett District*, Brighton, enlarging Brighton High School yard, \$10,000. This item was reported on last year.

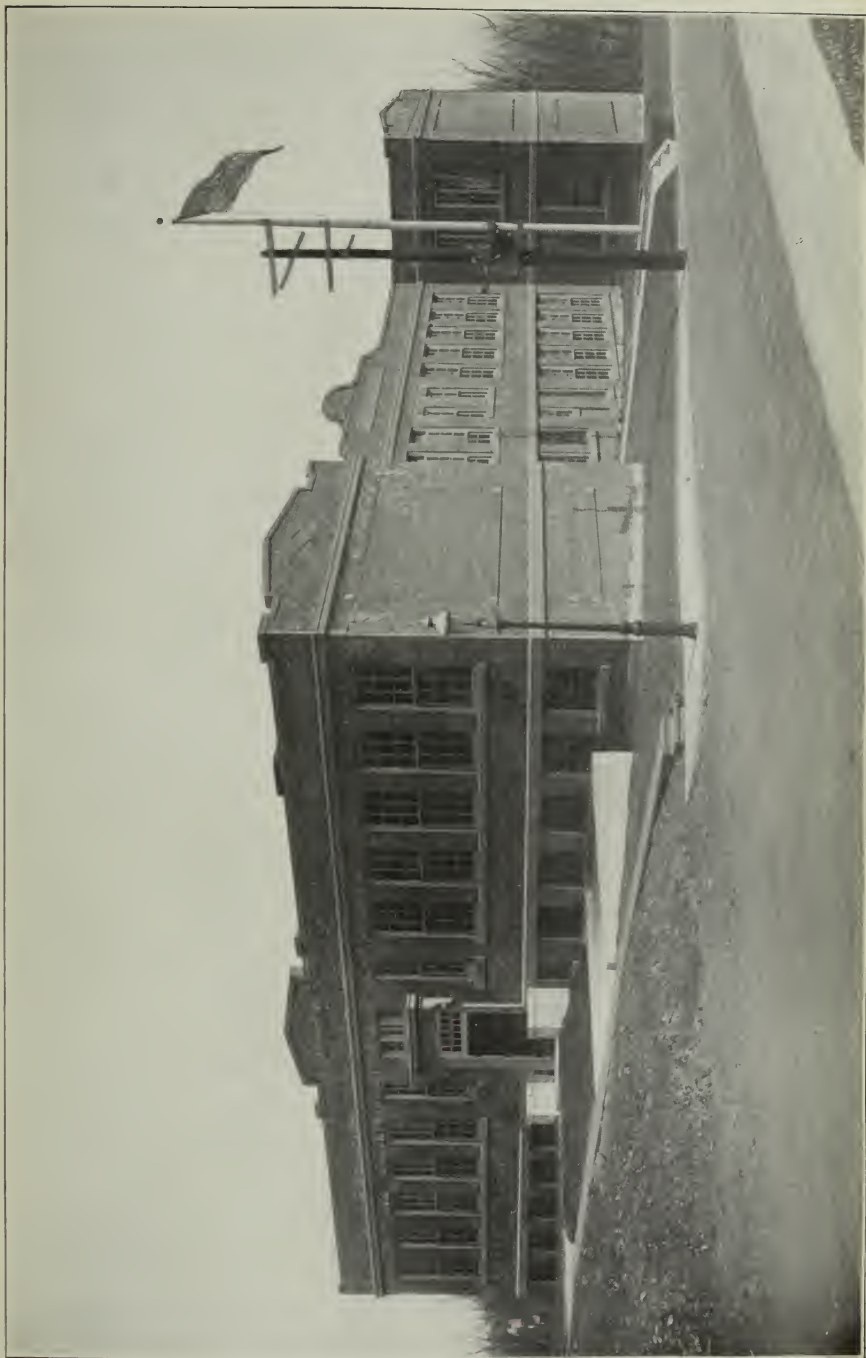
This completes the list of 1911-12 on both the Bond Issue and the Tax Levy.

On March 22, 1912, in accordance with Chapter 450 of the Acts of 1907, the School Committee sent to this Board the following list of items, with the number of pupils to be accommodated set opposite each school district:

	Pupils.
<i>Item 1.</i> —Dearborn District, Roxbury, High School of Practical Arts, completion of building	1,000
<i>Item 2.</i> —Lewis District, Roxbury, annex to Roxbury High School	200
<i>Item 3.</i> —Rice District, South End, Public Latin School, annex and supply department	120
<i>Item 4.</i> —Bennett District, Brighton, annex to Brighton High School	120
<i>Item 5.</i> —Oliver Wendell Holmes District, Dorchester, elementary school, upper grades	240
<i>Item 6.</i> —Oliver Wendell Holmes District, Dorchester, elementary school, lower grades	440

On March 22, 1912, this Board returned to the School Committee the above list with the amount set against each item which in its opinion would be required for the additional accommodation in each district specified:

Administration expenses	\$37,000
<i>Item 1.</i> —Dearborn District, Roxbury, High School of Practical Arts, completion of building	80,000
<i>Item 2.</i> —Lewis District, Roxbury, annex to Roxbury High School, completion of building	30,000
<i>Item 3.</i> —Rice District, South End, Public Latin School, annex and building for supply department	100,000
<i>Item 4.</i> —Bennett District, Brighton, annex to Brighton High School	100,000
<i>Item 5.</i> —Oliver Wendell Holmes District, Dorchester, elementary school, upper grades	78,000
<i>Item 6.</i> —Oliver Wendell Holmes District, Dorchester, elementary school, lower grades	75,000
	<hr/>
	<u>\$500,000</u>



ELLEN H. RICHARDS SCHOOL, BEAUMONT STREET, DORCHESTER.



In connection with the foregoing list, the following is a brief statement of the progress made in providing the accommodations specified:

Item 1.—Dearborn District, Roxbury, High School of Practical Arts, completion of building, \$80,000. The contract for this work was signed on June 7, 1912, and the work will be completed and the building ready for occupancy in September, 1913.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$286,786 00</u>	<u>\$293,852 50</u>

Item 2.—Lewis District, Roxbury, annex to Roxbury High School, completion of building, \$30,000. This item has been reported on as completed and the building occupied.

Item 3.—Rice District, South End, Public Latin School, annex and building for supply department, \$100,000. The contract for this work was let November 12, 1912, and the building will be completed and ready for occupancy at the opening of schools in September, 1913.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$89,410 00</u>	<u>\$89,012 00</u>

Item 4.—Bennett District, Brighton, annex to Brighton High School, \$100,000. The contract for this work was let December 6, 1912, and the building will be ready for occupancy in September, 1913.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$78,460 00</u>	<u>\$78,460 00</u>

Item 5.—Oliver Wendell Holmes District, Dorchester, elementary school, upper grades, \$78,000. This contract was signed on December 10, 1912, and the building will be completed and ready for occupancy in September, 1913.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$59,495 00</u>	<u>\$54,861 50</u>

Item 6.—Oliver Wendell Holmes District, Dorchester, elementary school, lower grades, \$75,000. On this item it was decided, after a conference with the Superintendent of Public Schools and the School Committee, to postpone action, and \$50,000 of the appropriation was transferred to other items which were considered more necessary at that time. In the meantime this Board, with the balance of the appropriation, bought the land, paying therefor \$13,646.56, had the plans made and are now ready to advertise. This contract will be let as soon as the amount taken from the appropriation has been restored by the School Committee.

This completes the list of items under the Bond Issue.

On March 22, 1912, the School Committee passed an order appropriating the sum of \$561,539, under the provisions of Chapter 388 of the Acts of 1909, for the purpose of constructing and furnishing new buildings, including the taking of land therefor and for school yards and the preparation of the same for use.

After a conference with the Mayor the School Committee rescinded the order passed on March 22, 1912, and the following order was passed: That in accordance with the provisions of Chapter 388 of the Acts of 1909 the sum of \$421,000 is hereby appropriated for the purpose of constructing and furnishing new buildings, including the taking of land therefor and for school yards, and the preparation of the same for use.

On April 10, 1912, the Board notified the School Committee that it intended to expend this appropriation for the following items selected from those designated by the School Committee, this being done after conferring with the Superintendent of Schools:

<i>Item 1.</i> — Franklin District, South End, elementary school, lower grades, land and building	\$100,000
<i>Item 2.</i> — Dudley District, Roxbury, high school for boys, land only	40,000
<i>Item 3.</i> — Abraham Lincoln District, city proper, Boston Industrial School for Boys, additional equipment	8,500
<i>Item 4.</i> — Bennett District, Brighton, elementary school, lower grades, building	7,000
<i>Item 5.</i> — Charles Sumner District, West Roxbury, elementary school, lower grades, land and building,	40,000
<i>Item 6.</i> — Longfellow District, West Roxbury, elementary school, lower grades, land and building	30,000
<i>Item 7.</i> — Emerson District, East Boston, elementary school, lower grades, land and building	60,000
<i>Item 8.</i> — Prince District, city proper, enlargement of building	45,000
<i>Item 10.</i> — Quincy District, city proper, Andrews School, enlargement of building	35,000
<i>Item 11.</i> — Quincy District, city proper, administration office and extension of school yard	6,500
<i>Item 12.</i> — Roger Wolcott District, Dorchester, elementary school, lower grades, land and building	30,000
<i>Item 16.</i> — Washington Allston District, Brighton, extension of school yard	3,000
<i>Item 18.</i> — Martin District, Roxbury, preparation of Normal School yard for use	2,500
<i>Carried forward</i>	<hr/> \$407,500



ROXBURY HIGH SCHOOL ANNEX.



<i>Brought forward</i>	\$407,500
<i>Item 20.</i> — Henry Grew District, Hyde Park, Hyde Park High School, extension of school yard	5,000
<i>Item 22.</i> — Samuel Adams District, East Boston, preparation of school yard for use	1,500
<i>Item 24.</i> — Elihu Greenwood District, Hyde Park, administration office	4,000
<i>Item 25.</i> — Blackinton District, East Boston, preparation of school yard for use	3,000
	<hr/>
	<u>\$421,000</u>

In connection with the foregoing list the following is a report of the progress made so far:

Item 1.— *Franklin District*, South End, elementary school, lower grades, land and building, \$100,000. In May, 1912, the Board advertised for land in this district, and after a public hearing, held June 20, 1912, notified the Street Commissioners to take land on Groton street, containing approximately 9,580 square feet of land, for which the Board paid \$9,000. On April 10, 1912, the Board appointed Messrs. Andrews, Jaques & Rantoul architects. Plans were drawn, the work was advertised and the contract signed October 10, 1912, and the building will be ready in June, 1913.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$69,550 00</u>	<u>\$67,413 85</u>

Item 2.— *Dudley District*, Roxbury, high school for boys, land only, \$40,000. After a conference with the Superintendent of Public Schools and the School Committee, it was decided to postpone action in regard to this matter and to transfer the money to other items which the Superintendent thought more necessary.

Item 3.— *Abraham Lincoln District*, city proper, Boston Industrial School for Boys, additional equipment, \$8,500. This equipment has been supplied as designated.

Item 4.— *Bennett District*, Brighton, elementary school, lower grades, building, \$7,000. After conferring with the Superintendent and the School Committee, action on this item was postponed and the money transferred to Item 15, Dillaway District, Roxbury, Bartlett street school, extension of school yard, Tax Levy Appropriation, 1912.

Item 5.— *Charles Sumner District*, West Roxbury, elementary school, lower grades, land and building, \$40,000. It was intended to make this a four-room building, but later was changed to an eight-room building and hall, and an additional amount of \$25,000 was added to the original appropriation for this purpose. The Board advertised for land on March 2, 1912, a hearing was held March 25, 1912, and on June 19, 1912, the

Board of Street Commissioners were notified to take a parcel of land on Jewett and Folsom streets, Roslindale. This was done September 12, 1912. The lot contained approximately 19,200 square feet of land, for which the Board paid \$6,380.10. On April 10, 1912, Mr. Charles J. Bateman was appointed architect. The plans were made and the contract awarded on November 21, 1912. The building will be completed and ready for occupancy on the opening of schools in the fall of 1913.

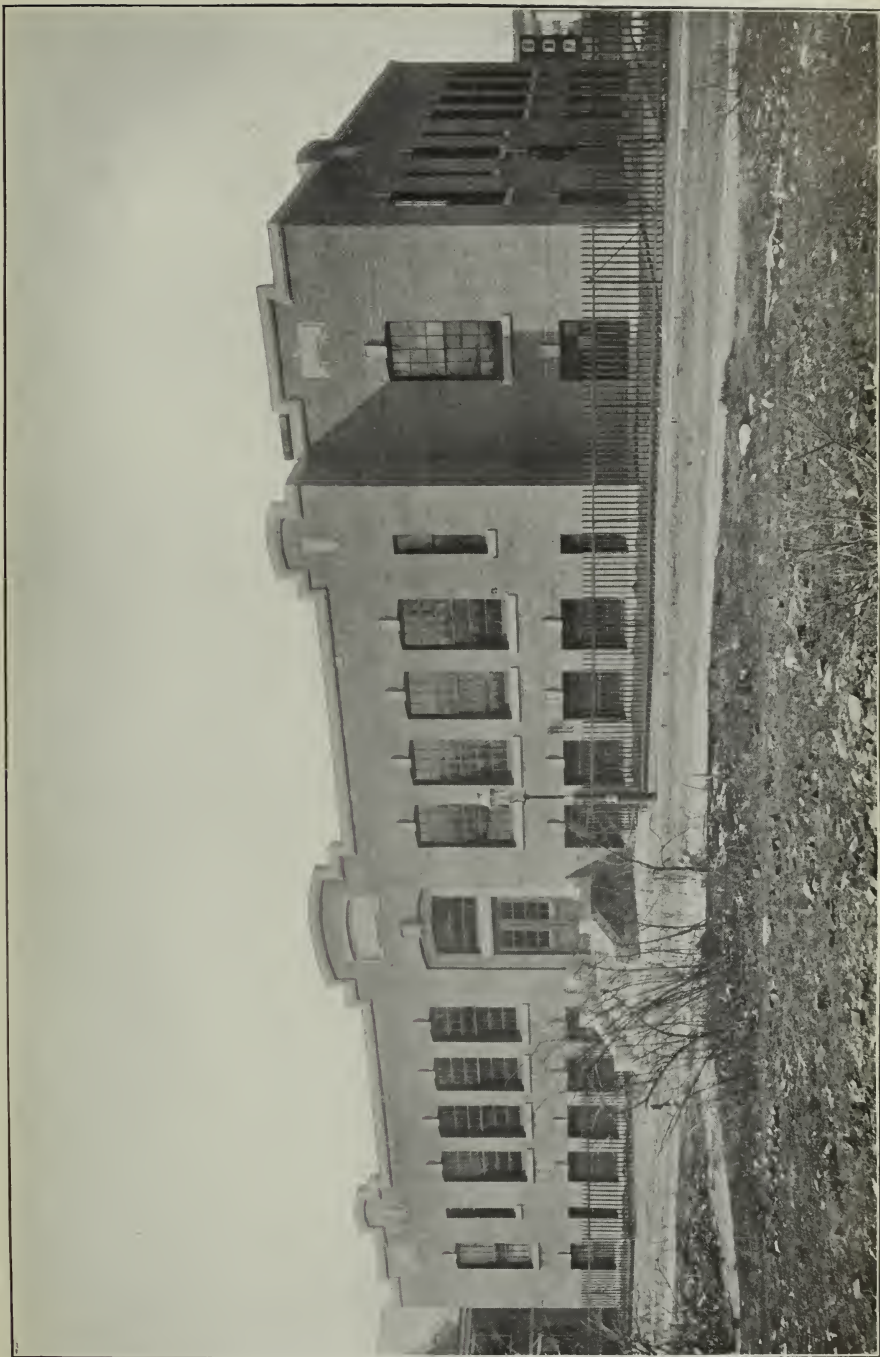
Item 6.—Longfellow District, West Roxbury, elementary school, lower grades, land and building, \$30,000. The Board advertised for land on March 2, 1912, a hearing was held March 25, 1912, and on May 29, 1912, the Board of Street Commissioners were notified to take a parcel of land on Eastbourne, Beech and Hobson streets, containing approximately 29,932 square feet of land. This was done August 2, 1912. The Board paid for this land \$5,986.40. On April 10, 1912, Messrs. Gay & Proctor were appointed architects. Plans were prepared and the work advertised. On August 23, 1912, the contract was signed. The building will be completed and ready for occupancy about the middle of February, 1913.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$25,000 00</u>	<u>\$22,786 00</u>

Item 7.—Emerson District, East Boston, elementary school, lower grades, land and building, \$60,000. The sum of \$40,000 derived from the Public Buildings Department for the sale of the Old East Boston High School property was transferred to this appropriation, making the total appropriation \$100,000. The Board advertised for land on April 13, 1912, a public hearing was held May 6, 1912, and on July 11, 1912, the Board of Street Commissioners were notified to take certain parcels of land on Trenton, East Eagle and Prescott streets, East Boston. This was done October 31, 1912. The lots contain approximately 25,433 square feet of land, for which the Board paid \$25,028.93. On April 17, 1912, Mr. T. Edward Sheehan was appointed architect. The plans have been completed, and the work advertised, and the Board expects to sign the contract within a few weeks, and to have the building ready for occupancy in October, 1913.

Item 8.—Prince District, city proper, enlargement of building, \$45,000. On April 10 Mr. Herbert L. Wardner was appointed architect. Plans were completed for an additional story and a hall, and on May 25, 1912, the work was advertised. On June 22, 1912, the contract was signed, the building completed and ready for occupancy at the opening of schools in September, 1912.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$69,994 00</u>	<u>\$49,085 35</u>



WILLIAM BRADFORD SCHOOL.



Item 10.— Quincy District, city proper, Andrews School, enlargement of building, \$35,000. The Board notified the Board of Street Commissioners on June 25, 1912, to take by eminent domain two parcels of land adjoining the Quincy School, and containing approximately 1,781 square feet of land. This was done September 10, 1912, the Board paying for the land the sum of \$8,670. On June 11, 1912, Mr. Harrison H. Atwood was appointed architect. Plans were prepared for two additional wings, one on either side of the building, containing three rooms each. After the work was advertised and the bids publicly opened it was found that the cost exceeded the appropriation, and the Board were unable to award the contract for but one wing. The contract was signed October 29, 1912, and will be completed about the first of July, 1913.

	Original Contract.	Contract to Date.
General contract (all trades) . . .	<u>\$46,925 00</u>	<u>\$25,235 50</u>

Item 11.— Quincy District, city proper, administration office and extension of school yard, \$6,500. Plans for this administration office and the extension of the school yard were made in this department. The work has been completed and office occupied since the opening of schools in the fall of 1913.

	Original Contracts.	Contracts to Date.
Contract for building administration office . . .	\$5,123 00	\$4,752 00
Contract for paving of yard . . .	1,698 00	1,768 00
	<u>\$6,821 00</u>	<u>\$6,520 00</u>

Item 16.— Washington Allston District, Brighton, extension of school yard, \$3,000. On this item the Board felt that there was no immediate need for an extension of this yard, and the money was transferred to Item 6, Roger Wolcott District, elementary school, upper grades (Mary Lyon School), Tax Levy Appropriation, 1910.

Item 18.— Martin District, Roxbury, preparation of Normal School yard for use, \$2,500. The Board has deferred action on this item, as the ground has been filled in and looks fairly well, and the Board thought it better to wait until spring to find out whether or not it was really necessary to spend this amount of money.

Item 20.— Henry Grew District, Hyde Park, Hyde Park High School, extension of school yard, \$5,000. On December 3, 1912, this Board notified the Board of Street Commissioners to take a parcel of land in the rear of the present high school, containing approximately 31,000 square feet.

Item 22.—Samuel Adams District, East Boston, preparation of school yard for use, \$1,500. Contract for this work was let July 24, 1912, and was completed and accepted December 20, 1912.

	Original Contract.	Contract to Date.
Contract for grading	<u>\$2,974 50</u>	<u>\$2,000 00</u>

Item 24.—Elihu Greenwood District, Hyde Park, administration office, \$4,000. This work was advertised and the contract signed July 5, 1912, and the contract accepted about November 6, 1912.

	Original Contract.	Contract to Date.
General contract (all trades)	<u>\$1,625 00</u>	<u>\$1,869 00</u>

The money remaining on this appropriation, \$2,131, was transferred to the Prince District, enlargement of building, Tax Levy Appropriation, 1912.

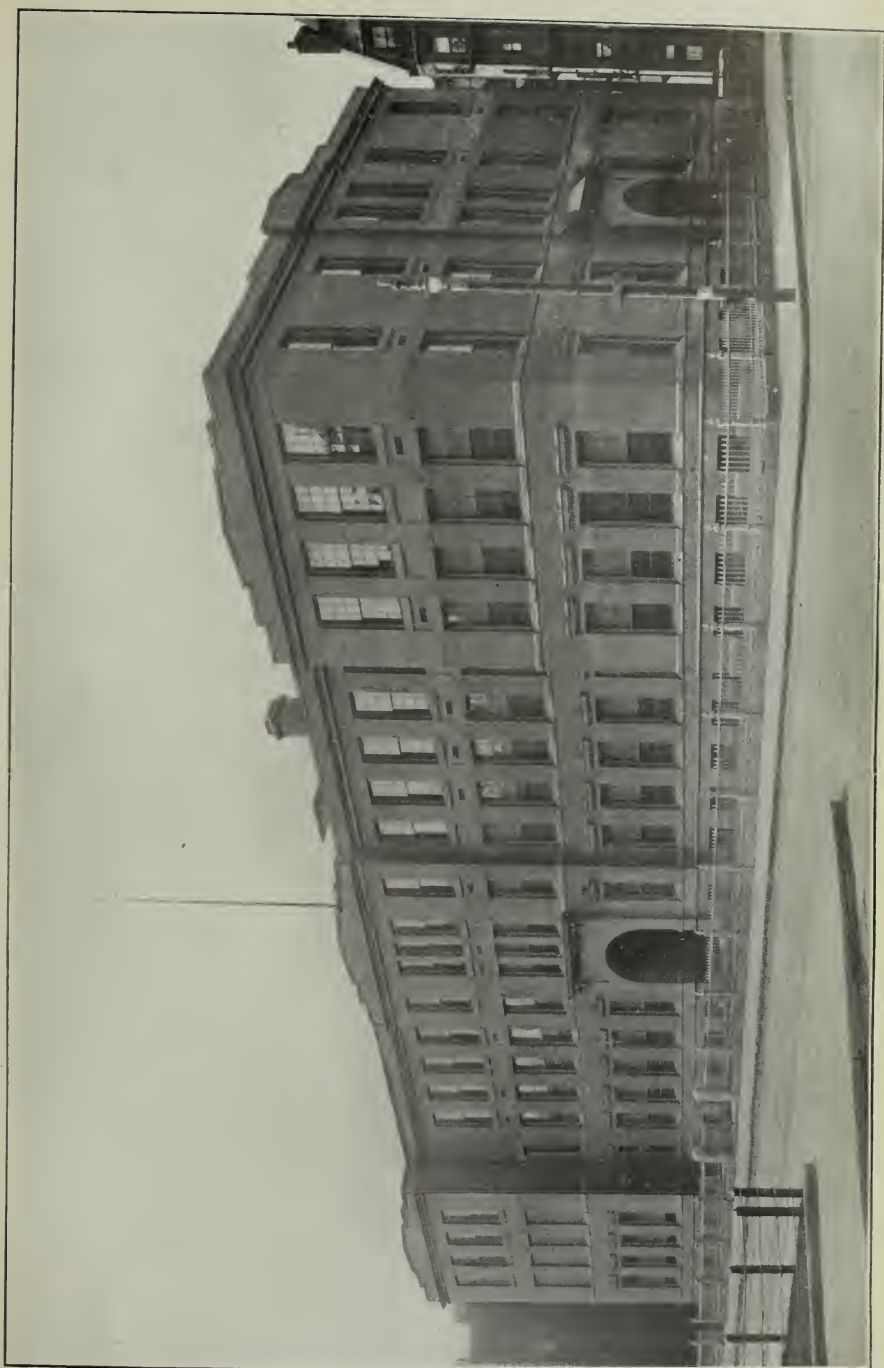
Item 25.—Blackinton District, East Boston, preparation of school yard for use, \$3,000. The contract for this work was made July 23, 1912, and completed about November 11, 1912.

	Original Contract.	Contract to Date.
General contract	<u>\$1,940 00</u>	<u>\$1,940 00</u>

This completes the items for the Tax Levy Appropriation, 1912-13, both as to the funds granted to the Board from the bond issue appropriation and from the appropriation voted by the School Committee out of the tax levy.

(2.) FUTURE ACCOMMODATION.

The situation in the West End has changed so unexpectedly that the Board believes that it will be necessary to erect a new building, which should contain twenty or possibly twenty-four rooms. The Board also recommends the sale of the Somerset Street School, Sharp School, Baldwin School and Grant School, and that a new building large enough to accommodate the pupils of these schools be erected. This would take care of the West End for many years. At the present time there are three portable buildings in the district and four rooms in outside buildings on Chambers street. We have found great difficulty in renting suitable quarters for school purposes in this section of the city.



THIRD STORY ADDITION, PRINCE SCHOOL, NEWBURY STREET.



ASSEMBLY HALL, PRINCE SCHOOL ADDITION.

HERBERT L. WARDNER, Architect.

In the Phillips Brooks District the Board has erected in the last two years two buildings of twenty-eight rooms, but the conditions are yet so overcrowded there that it will be necessary to erect another building in this district.

With the finishing of the High School of Practical Arts, and if the High School of Commerce is finished, it would seem as if the high school situation had been taken care of, and the situation in the elementary schools, with the exception of the two districts named, would seem to be in such good condition that the Board thinks it is possible to drop the Loan Fund after this year, believing that all the needs can be taken care of out of the tax levy.

(3.) FIRE PROTECTION.

For the past two years the amounts set aside for fire protection in the summer vacation budget have been taken from the "Repair Appropriation," this being the only available source at the Board's disposal for the performance of this very necessary work. This year the Board appropriated the sum of approximately \$17,000 for this purpose. This money was expended on the installation of the fire alarm system, fire alarm boxes, fireproofing of the basements of old buildings, and the erection of fire escapes. During the summer vacation the basements of the following buildings were fireproofed:

Albert Palmer School, Amos Webster School, Austin School, Canterbury Street School, Charlestown High School, Chestnut Avenue School, Choate Burnham School, Elihu Greenwood School (coal bin), Girls' Latin School, Hillside School, Lawrence School, Old Gibson School, School Committee (coal bin), Thomas Gardner Annex, Washington Allston Annex, Weld School, Hyde Park.

Fire escapes were erected on the following buildings: Lawrence School, Norcross School and the School Committee building. Exit stairs were erected on the following schools: Bailey Street School and Harbor View Street School.

Fire alarm systems were installed in seven schools, and a fire alarm box in one school. These latter items will be more fully covered under the special report of the electrical engineer of the department.

During the month of January of the present year the Board issued orders to the heads of divisions and the inspectors of the various districts to prepare a complete list of fire protection items of every school of the city requiring same. This order has been complied with and the Board now has an accurate account of every existing need in this line. Should the present bill before the Legislature, described in the account of "Repairs," be favorably acted upon by the body, the Board will be enabled to perform a large proportion of the fire protection items contained in the prepared list referred to above.

While believing it to be sound policy to use every means possible to guard against fires in the schools, the Board is more fully convinced than ever that all danger to the pupils arising from fire is reduced to a minimum by the existing fire alarm drill. On all occasions where fires occurred in the schools during the past year the children marched to safety in perfect order.

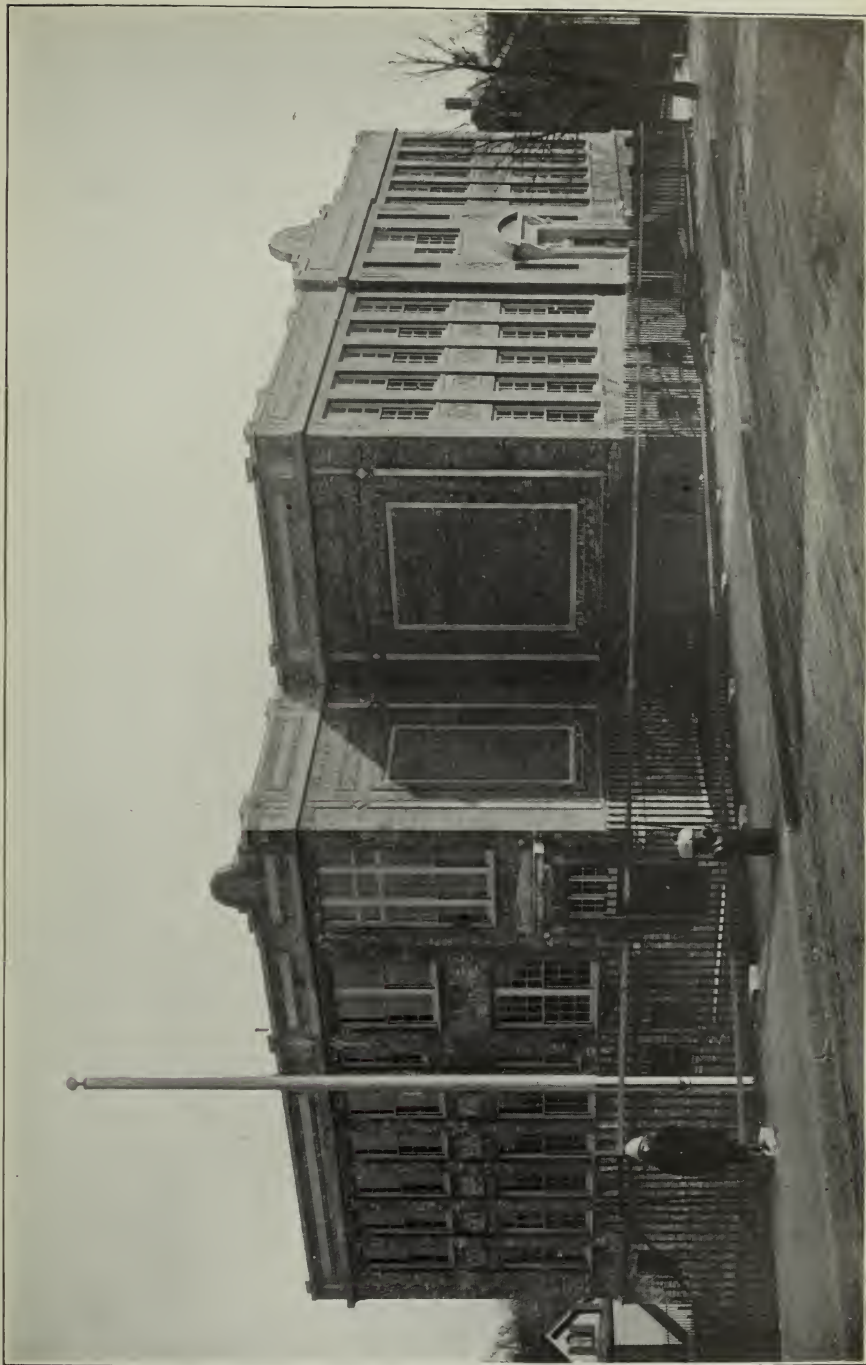
III.

REPAIRS.

The new policy inaugurated by the Board in regard to repairs, and fully described in the 1911-12 Annual Report under the caption "Repairs," was continued during the present year. The minimum required by law, viz., 25 cents on the thousand dollars assessed valuation, was again turned over to our Board for the Repair Appropriation, which amounted to \$351,000.

After setting aside the usual amount for fixed charges, viz., administration expenses, \$5,000 as a reserve fund for emergencies, \$12,000 as a monthly disbursement for ordinary repairs, the Board had a balance of approximately \$196,000 to perform the regular budget of summer repairs. When this budget was presented for consideration, at a meeting held for this purpose by the Board with the four heads of divisions, the inspectors of the various districts and the other subordinates of the department, it was found that the actual amount of the budget totaled approximately \$541,000, which was \$345,000 in excess of the amount at the Board's disposal for the performance of vacation work.

As in previous years, the usual cutting and pruning was once more put into effect, with the result that many



BENEDICT FENWICK SCHOOL, MAGNOLIA STREET, DORCHESTER.



necessary repairs were eliminated and a budget of actual necessities decided upon in accordance with the amount of money available. Following out the previous year's policy, specifications were prepared early in the year for work to be performed during vacation, bids for same advertised and invited and contracts awarded before the closing of the schools, and all work undertaken completed during vacation.

Apart from the usual items of repairs performed during the summer vacation in carpentry, painting, tinting, masonry, heating, ventilating, plumbing, electrical, blackboard and furniture work and moving portables, the Board also undertook and completed the following major items during this period:

Heating and Ventilating Division. — The Fairmount School, Hyde Park, two new boilers, new chimney, new coal bin and concrete floor in basement. The Franklin School, two new boilers and new direct indirect radiation. Samuel G. Howe School, two new boilers and new chimney. Bigelow School, new fan and motor and new primary radiator to furnish required amount of air for ventilation; old engine and fan removed. Roger Clap School, new fan and motor to furnish proper amount of air both for ventilation and for heating.

Electrical Division. — Electric lighting was installed in sixty-three class-rooms throughout the various districts, complete telephone systems in two schools and electric clock system in one. In addition to these items seven reflectoscopes were installed in various schools.

Plumbing and Sanitation Division. — Extra sanitation and plumbing were installed in nineteen schools outside of the sanitation in connection with the major work performed by the Architectural Division of this department.

Architectural Division. — Abraham Lincoln School, nurse's room. Bennett, supply closet. New cooking rooms in Comins, Elihu Greenwood and Shurtleff Schools. New teachers' rooms in the Comins and Fairmount Schools. Manual training rooms in the Comins, Frothingham, Hyde Park High, Dorchester High and Wendell Phillips Schools. Lunch counters in Trade School for Girls and West Roxbury High School. Fresh-air room in Washington School. Alterations at 24 Hull street for special class. Household science room at Dorchester High School.

Civil Engineering Division. — Grading and paving yards in the Atherton, Benjamin Cushing, Blackinton, Mary Lyon, Quincy, Samuel Adams, James Otis, Nathan Hale, and Joshua Bates Schools. Iron fences, John Winthrop, Samuel Adams, Atherton, South Boston High, Joseph Tuckerman, Rice, Nathaniel Hawthorne. Retaining walls, Atherton, John Winthrop and Peter Faneuil.

Besides defraying the cost of all the above-mentioned major items from the repair appropriation it was subjected to still further reduction by being made to assume the expense of the following: New manual training, prevocational and domestic science equipment, \$5,400; nurses' equipment, \$1,000; athletic equipment, \$1,800; evening and continuation school equipment, \$2,000.

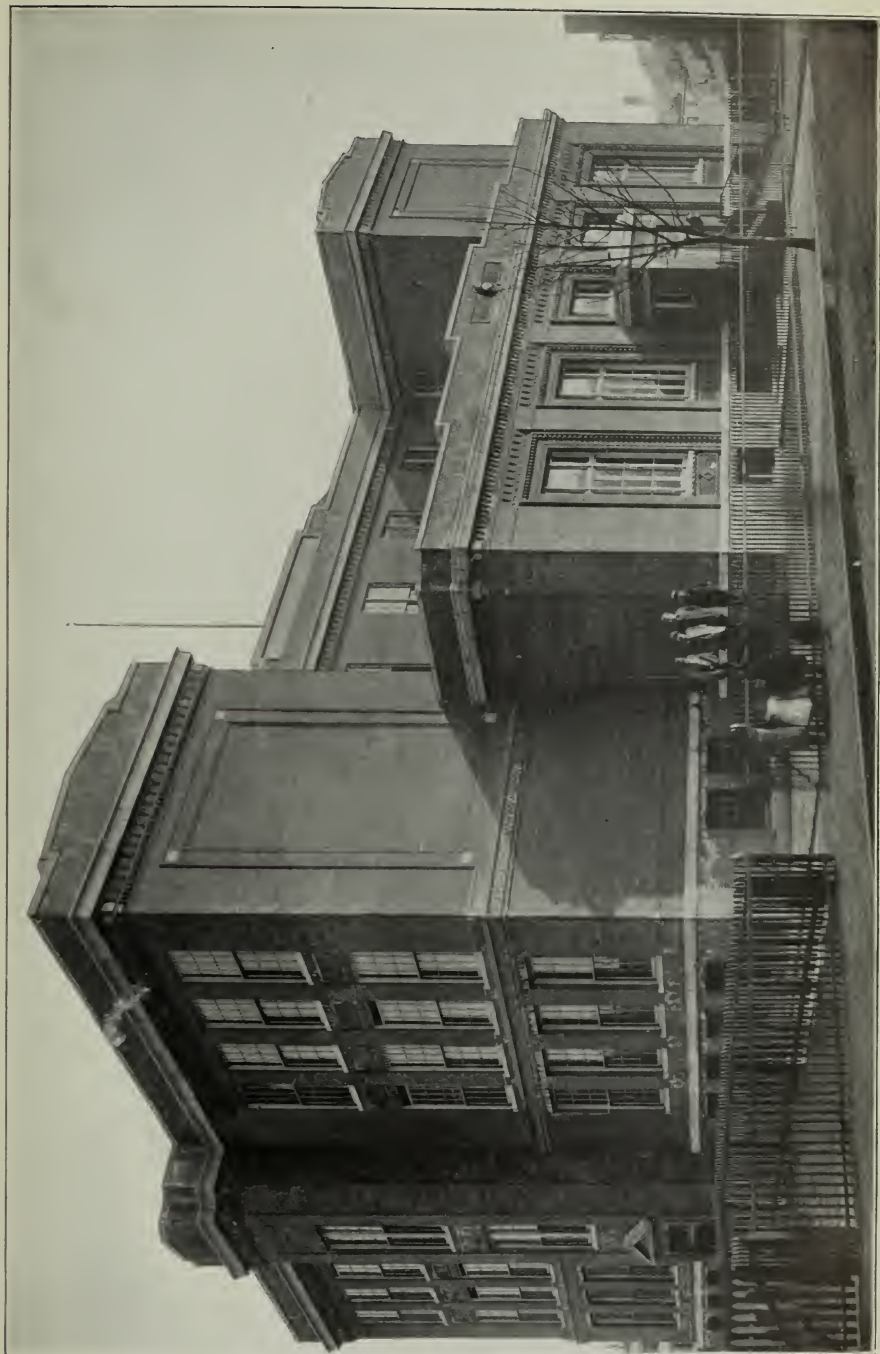
Each report submitted since the formation of the Schoolhouse Department has drawn attention to the necessity of increasing the repair fund but has proved of no avail. The present Board has lost no opportunity of impressing this fact on all connected with the educational system, and has so thoroughly covered the subject in its two previous reports that the Board believes it would serve no useful purpose to refer in this report to such a time-worn subject, as your Honor and the members of the School Committee thoroughly realize the importance of appropriating more than the minimum for repairs in order to protect the city property.

A bill has been introduced in the present Legislature requesting the transfer of ten cents to the repair fund from the forty cents tax rate which is available for new buildings for this year, and five cents for each year hereafter, and the Board hopes that with the support of your Honor and the members of the School Committee this bill will be favorably acted upon by the Legislature, thus providing a suitable appropriation to enable our Board to perform a long list of outstanding repairs.

IV.

IN CONCLUSION.

The Board wishes to express its appreciation of your Honor's support in their efforts to carry out their work for the best interests of the city; also to the School Committee for their assistance and hearty co-operation; to the Superintendent of Schools, whose valuable



ULYSSES S. GRANT SCHOOL, PARIS STREET, EAST BOSTON.



ASSEMBLY HALL, ULYSSES S. GRANT SCHOOL.
EDWARD T. P. GRAHAM, ARCHITECT.

assistance has at all times been freely given, and to the chairman of the Committee on Elementary Schools, who has always been anxious to aid us by his advice; and to the masters of the various districts who have rendered every possible assistance to our Board in carrying out its work.

Respectfully submitted,

CHARLES LOGUE,
JOHN F. KENNEDY,
CHARLES BRUEN PERKINS,
Commissioners.

APPENDICES.

APPENDIX I.

 APPROPRIATION FOR LAND AND BUILDINGS FOR SCHOOLS.

I.

TOTAL APPROPRIATIONS AND CREDITS RECEIVED BY THE
DEPARTMENT FROM THE DATE OF ITS ESTABLISHMENT
TOGETHER WITH A SUBDIVISION OF THE EXPENDITURES
TO FEBRUARY 1, 1913.

Appropriations.

Bond issue 1901-02	\$1,000,000 00
Bond issue 1902-03	1,500,000 00
Bond issue 1903-04	1,500,000 00
Bond issue 1904-05	1,500,000 00
Bond issue 1905-06	1,500,000 00
Bond issue 1907-08	1,000,000 00
Bond issue 1908-09	1,000,000 00
Bond issue 1909-10	500,000 00
Bond issue 1910-11	500,000 00
Tax levy 1910-11	529,557 00
Bond issue 1911-12	500,000 00
Tax levy 1911-12	405,000 00
Bond issue 1912-13	500,000 00
Tax levy 1912-13	421,000 00

Credits.

Received from sale of North Margin Street School	8,100 00
Received from sale of Old Webb School	3,000 00
Received from sale of house on Longfellow lot	1,250 00
Received from sale of Old Brighton High School	115 00
Received from sale of Bon Homme Richard School	25 00
Received from sale of land adjoining Mechanic Arts High School	25 00
Received from the sale of portable buildings,	1,312 00

Carried forward \$12,369,384 00

<i>Brought forward</i>	\$12,369,384 00
Received as damages for abolition of grade crossing at the Walnut Street School, Minot District	500 00
Received from sale of Old East Boston High School	40,000 00
Total	<u>\$12,409,884 00</u>

Expenditures.

Amount expended for sites, erection and furnishing of new buildings	\$10,105,144 66	
Amount expended for installation of new sanitation, and the alteration of heating and ventilating systems in old buildings	670,821 81	
Amount expended for administration expenses	257,517 33	
Amount expended for erection and furnishing of portable buildings	173,243 43	
Amount expended for fire escapes, fire extinguishers, interior fire protection, and fire alarm systems	165,465 51	
Amount expended for engineering services	81,516 79	
Amount expended for enlarging school yards	164,446 72	
	<u>11,618,186 25</u>	
Amount unexpended February 1, 1913	<u>\$791,697 75</u>	

II.

The following statement shows the expenditures on account of the above appropriation from February 1, 1912, to February 1, 1913:

Appropriations and credits 1912-13	<u>\$1,638,883 03</u>
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Brighton High School Annex.

Site	\$339 40	
Building	250 43	
	<u>\$589 83</u>	
<i>Carried forward</i>	\$589 83	

Brought forward \$589 83

*Brimmer School, Extension of Yard, and Trade
School for Boys, Boston Industrial School
for Boys.*

Building	\$4,847 32	
Furnishings	15,052 52	
	<hr/>	19,899 84

Girls' High School Enlargement.

Building	\$2,399 18	
Furnishings	1,069 29	
	<hr/>	3,468 47

High School of Practical Arts.

Site	\$18,602 35	
Building	120,520 59	
Furnishings	6 85	
	<hr/>	139,129 79

Boys' High School, Dudley District.

Site		7 10
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Mechanic Arts High School Extension.

Furnishings		1,057 58
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Public Latin Annex and Supply Building.

Building		8,192 10
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Roxbury High School Addition.

Site	\$25 00	
Building	88,629 91	
Furnishings	3,552 48	
	<hr/>	92,207 39

West Roxbury High School Enlargement.

Furnishings		89 65
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*Elementary School, Andrews School
Enlargement.*

Site	\$8,745 00	
Building	1,226 89	
	<hr/>	9,971 89

Elementary School, Bennett District.

Building		99 23
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<i>Carried forward</i>		<hr/> \$274,712 87
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SCHOOLHOUSE DEPARTMENT.

23

Brought forward \$274,712 87

*Elementary School, Blackinton District,
Blackinton School.*

Site	\$3,086 06	
Building	1,942 90	
	<hr/>	5,028 96

Elementary School, Charles Sumner District.

Site	\$6,457 93	
Building	6,295 20	
	<hr/>	12,753 13

*Elementary School, Comins District, Charles
Bulfinch School.*

Building	\$1,690 37	
Furnishings	12 25	
	<hr/>	1,702 62

*Elementary School, Edward Everett District,
J. L. Motley School.*

Furnishings		29 48
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*Elihu Greenwood District, Administration
Office.*

Building		1,868 40
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Elementary School, Emerson District.

Site		25,233 93
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Elementary School, Franklin District.

Site	\$8,150 00	
Building	12,725 34	
	<hr/>	20,875 34

*Elementary School, Henry L. Pierce District,
Ellen H. Richards School.*

Site	\$4,807 11	
Building	41,377 43	
	<hr/>	46,184 54

*Elementary School, Lewis District,
Lewis School.*

Building	\$29,643 13	
Furnishings	7,269 41	
	<hr/>	36,912 54

Carried forward		\$425,301 81
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Brought forward \$425,301 81

*Elementary School, Longfellow District,
Mozart School.*

Site	\$6,089 23	
Building	18,666 27	
	<hr/>	24,755 50

*Elementary School, Lyman District,
U. S. Grant School.*

Site	\$15,838 26	
Building	55,740 54	
Furnishings	7,706 17	
	<hr/>	79,284 97

*Elementary School, O. W. Holmes District,
Upper Grades, Marshall Addition.*

Site	\$3,450 00	
Building	5,102 78	
	<hr/>	8,552 78

*Elementary School, O. W. Holmes District,
Lower Grades.*

Site		13,774 40
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*Elementary School, Phillips Brooks District,
John Winthrop School.*

Building	\$2,842 33	
Furnishings	3,774 48	
	<hr/>	6,616 81

*Elementary School, Phillips Brooks District,
Benedict Fenwick School.*

Building	\$58,852 96	
Furnishings	1,288 13	
	<hr/>	60,141 09

*Elementary School, Prince District,
Enlargement of Building.*

Building	\$54,620 30	
Furnishings	1,759 64	
	<hr/>	56,379 94

*Elementary School, Prescott District,
J. A. McDonald School.*

Building	\$870 20	
Furnishings	451 40	
	<hr/>	1,321 60

Carried forward \$676,128 90

Brought forward \$676,128 90

*Elementary School, R. G. Shaw District,
Germantown School.*

Site	\$3,229 50	
Building	511 74	
Furnishings	15,898 46	
	<hr/>	19,639 70

*Elementary School, Roger Wolcott District,
Mary Lyon School.*

Building	\$3,578 57	
Furnishings	788 71	
	<hr/>	4,367 28

*Elementary School, Roger Wolcott District,
William Bradford School.*

Site	\$456 35	
Building	43,541 16	
Furnishings	1,821 43	
	<hr/>	45,818 94

Elementary School, Mary Lyon District.

Site	\$4,835 70	
Building	13,495 17	
	<hr/>	18,330 87

*Elementary School, Sherwin District, Lafayette
School (a), George T. Angell School (b).*

Building (a)	\$11,077 25	
Furnishings (a)	1,632 81	
Furnishings (b)	24 11	
	<hr/>	12,734 17

Warren District, Administration Office.

Building	1,384 45
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*Elementary School, Winthrop Brimmer District,
Abraham Lincoln School.*

Building	\$1,509 79	
Furnishings	544 81	
	<hr/>	2,054 60

Bartlett Street, Extension of Yard.

Site	\$6,650 00	
Building	90 00	
	<hr/>	6,740 00

Carried forward \$787,198 91

<i>Brought forward</i>	\$787,198 91
<i>Brighton High School, Enlarging Yard.</i>	
Site	4,275 00
<i>Edward Everett School, Extension of Yard.</i>	
Building	13 20
<i>Harvard Hill School, Extension of Yard.</i>	
Building	848 00
<i>Normal School, Extension of Yard.</i>	
Building	59 00
<i>Quincy School, Extension of Yard and Office.</i>	
Site	\$6,516 39
Building	7,172 37
	13,688 76
<i>Samuel Adams School, Preparation of Yard.</i>	
Building	1,575 30
<i>Fire Protection.</i>	
Fire escapes	250 00
<i>Administration Expenses.</i>	
Salaries of employees	\$30,735 79
Rental of offices	2,250 00
Automobile care and maintenance	5,208 00
Printing and advertising	222 71
Stationery	182 80
Blueprint paper	193 90
Photo supplies	33 47
Supplies	77 31
Miscellaneous	373 13
	39,277 11
Total expenditures	\$847,185 28
Amount voted and set aside but not expended to date for sites, construction and furnishing of new buildings, engineering and administration expenses	\$784,128 44
Balance unappropriated	7,569 31
	791,697 75
	<u>\$1,638,883 03</u>

III.

Elementary schools	\$543,016 42
High schools	264,641 75
Administration expenses	39,277 11
Fire protection	250 00
	<hr/>
	<u>\$847,185 28</u>

IV.

Amount received from rents, sale of old build- ings, etc.	<u>\$41,812 00</u>
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APPENDIX II.

APPROPRIATION FOR REPAIR AND ALTERATION
WORK, NEW EQUIPMENT, FURNITURE (NEW
AND REPAIRS TO OLD), RENTS AND TAXES,
AND EXPENSES OF THE COMMISSION.

I.

GENERAL STATEMENT.

During the year February 1, 1912, to February 1, 1913, the following sums were expended by the Schoolhouse Department for repair and alteration work, new equipment, furniture (new and repairs to old), rents and taxes, and expenses of the commission:

February 1, 1912, appropriation	<u>\$399,000 00</u>
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*Repairs and Equipment.**Carpentry:*

Repairs	\$43,753 39
Alterations	7,512 90
New floors	4,371 71
Flagstaffs	1,397 89
Locksmithing	2,907 07
Hardware	12 38

Furniture:

New	24,398 12
Repairs	18,602 84
New curtains	3,975 36
Curtain repairs	1,014 30
New clocks	220 75
Clock repairs	1,056 33
Gymnasium apparatus	901 63

Blackboards:

New	333 65
Repairs	6,703 55

<i>Carried forward</i>	<u>\$117,161 87</u>
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<i>Brought forward</i>	\$117,161 87
<i>Plumbing:</i>	
Repairs	17,591 11
Drinking fountains	387 84
Automatic tanks	11,807 10
<i>Roofing:</i>	
Repairs	14,758 62
<i>Painting:</i>	
Painting	20,892 68
Glazing	6,728 65
<i>Heating:</i>	
Repairs	29,161 74
New boilers	934 00
Boiler installation	20,007 22
Ventilation	808 43
Motors and engines	648 83
Care of thermostats	14 40
<i>Masonry:</i>	
Repairs	16,410 94
Paving	7,968 05
Catch-basins	1,533 39
Asphalt and concrete	315 50
Fire protection	174 00
Grading	745 60
Planting	921 15
<i>Electrical:</i>	
Electric light installation	8,651 96
Electric light maintenance	1,861 13
Electric bells and telephone installation	1,013 97
Electric bells and telephone maintenance	4,286 07
Electric clock installation	183 91
Electric clock maintenance	2,279 51
Fire alarm installation	4,967 13
Fire alarm maintenance	3,168 99
Gas appliance installation	1,388 95
Gas appliance maintenance	1,114 89
Industrial apparatus installation	3,709 74
Industrial apparatus maintenance	540 07
<i>Carried forward</i>	\$302,137 44

Brought forward . . . \$302,137 44

Miscellaneous:

Iron and wire work . . .	6,557 97
Janitors' supplies . . .	420 22
Care and cleaning . . .	1,967 90
Teaming . . .	2,440 60
Rubber treads and matting . .	829 15
Gypsy moths . . .	560 00
Fire extinguishers . . .	364 67
Fire escapes . . .	9,936 79
Vacuum cleaner maintenance . .	139 45

Administration Expenses.

Salaries, commissioners and clerks, . . .	13,996 66
Salaries, inspectors . . .	18,844 23
Rent of offices . . .	2,243 33
Electric lighting of offices . . .	285 96
Postage . . .	572 03
Printing . . .	1,051 42
Stationery . . .	431 85
Advertising . . .	79 20
Telephone . . .	956 04
Messenger service . . .	20 00
Automobile expenses . . .	5,148 86
Furniture . . .	850 62
Car fares, traveling expenses . .	1,721 04
Ice . . .	15 00
Boiler insurance . . .	74 66
Sundries . . .	61 00
Subscription . . .	28 00
Teaming . . .	5 85

Total repairs and administration expenses . \$371,739 94

Hired Buildings, Rents and Taxes.

Barham Memorial Church . . .	\$600 00
Beech street lot . . .	125 00
Boylston street, 48 . . .	1,301 67
Boylston street, 480 . . .	375 00
Chambers street, 38 (St. Andrew's Chapel) . . .	1,080 00
Chambers street, 103 . . .	1,620 00
Chelsea street, 18 . . .	275 00
Dover street, 23 . . .	160 00
East Fourth street, 484, South Boston . . .	500 00

Carried forward . . . \$6,036 67 \$371,739 94

<i>Brought forward</i>	\$6,036 67	\$371,739 94
Eliot street, Jamaica Plain (Trustees' Building)	420 00	
Florence street, 13	105 00	
Franklin Union	3,221 67	
German Lutheran Church	164 00	
Greenwood Hall, Glenway street, Dorchester	600 00	
Hanson street	360 00	
Hull street, 24	245 00	
Hyde Park Gymnasium	130 00	
Jordan Hall	45 00	
Lauriat avenue, 170, Dorchester, Moon street	600 00	
	450 00	
Mechanics Building, Huntington avenue	6,168 15	
Parmenter street, 20	1,000 00	
Perrin street, 6	295 00	
Saratoga street, 66	26 00	
Saratoga street, 399, East Boston, Terrace street, 29	300 00	
	625 00	
Tileston street, 52	540 00	
Tremont street, 168	1,895 00	
Tremont street, 563	2,029 40	
Walnut avenue and Walnut park, Waterford street, 6	631 67	
	120 00	
Waterford street, 11	1,237 50	
Warrenton street, 25	15 00	
Total rents and taxes		27,260 06
Grand total		<u>\$399,000 00</u>

II.

SUBDIVISION OF EXPENDITURES.

Elementary schools	\$284,836 24
Administration and incidental expenses	56,584 04
High schools	49,951 31
School Committee Building	7,628 41
	<u>\$399,000 00</u>

III.

SUBDIVISION AS TO SCHOOLS.

Aaron Davis	\$940 99
Abby W. May	905 92
Abraham Lincoln	1,686 39
<i>Carried forward</i>	<u>\$3,533 30</u>

<i>Brought forward</i>	\$3,533 30
Aberdeen	262 07
Adams and Chestnut Streets	348 59
Adams Street	156 91
Agassiz	1,142 37
Albert Palmer	815 93
Amos Webster	863 95
Andrews	321 65
Asa Gray	967 77
Atherton	3,303 12
Auburn	434 96
Austin	493 42
Bailey Street	555 48
Baldwin	246 12
Benedict Fenwick	98 55
B. F. Tweed	219 47
Benjamin Cushing	1,891 51
Benjamin Dean	651 75
Benjamin Pope	415 41
Bennett	1,224 06
Bennett Branch	495 91
Bigelow	4,958 68
Blackinton	2,036 76
Boston Industrial	376 35
Bowditch	743 55
Bowdoin	1,620 42
Brewster	538 45
Brewster Annex	84 48
Brighton High	1,314 92
Bunker Hill Grammar	2,236 01
Bunker Hill Primary	547 01
Butler	136 00
Canterbury Street	397 67
Capen	1,500 75
Chapman	1,886 73
Charles Bulfinch	540 05
Charles C. Perkins	229 45
Charles Sumner	722 87
Charlestown High	2,141 56
Chestnut Avenue	961 81
Choate Burnham	841 82
Christopher Columbus	946 76
Christopher Gibson	1,018 49
Clinch	510 06
Comins	6,933 26
Commercial High	780 14
Commodore Barry	1,770 29
Common Building, Normal Group	3 53
Common Street	706 47
<i>Carried forward</i>	<hr/> \$54,926 64

<i>Brought forward</i>	\$54,926 64
Cook	272 69
Copley	541 12
Cottage Place	149 67
Cudworth	1,668 21
Cushman	988 22
Cyrus Alger	754 40
Damon	597 48
Dearborn	2,579 48
Dillaway	1,812 26
Dorchester Avenue	592 44
Dorchester High	11,066 41
Drake	407 90
Dudley	1,251 17
Dwight	1,015 46
East Boston High	2,181 19
Edward Everett	777 49
Eldridge Smith	601 04
Elihu Greenwood	2,297 31
Eliot	1,185 99
Elizabeth Peabody	127 41
Ellen H. Richards	1 06
Ellis Mendell	853 74
Emerson Grammar	830 70
English High	4,864 57
Everett Grammar	606 94
Everett Primary	399 57
Fairmount	8,048 67
Farragut	691 03
Florence Street	498 43
Frances E. Willard	127 56
Francis Parkman	1,235 31
Franklin	6,654 58
Frederic W. Lincoln	1,524 61
Frederic A. Whitney	282 05
Freeman	422 20
Frothingham	2,238 52
Frothingham Annex	263 02
Gaston	1,252 79
George Bancroft	335 14
George Putnam	1,513 86
George T. Angell	190 48
Gilbert Stuart	1,650 35
Girls' High	3,564 71
Girls' Latin	1,435 62
Glenway	354 37
Glenway Annex	53 58
Grant	123 97
Hancock	1,411 06

Carried forward \$127,222 47

<i>Brought forward</i>	\$127,222 47
Hancock Annex	86 73
Harbor View Street	622 85
Harris	683 31
Harvard Grammar	1,398 62
Harvard Hill	690 21
Harvard Primary, Brighton	222 97
Hawes Hall	610 38
Heath Street	92 11
Hemenway	167 33
Henry Grew	2,914 84
Henry L. Pierce	1,135 35
Henry Vane	502 52
Hillside	582 57
Hobart Street	452 57
Horace Mann	669 69
Howard Avenue	320 14
Howard Avenue Annex	49 53
Hugh O'Brien	1,973 72
Hugh O'Brien Annex	69 19
Hull	569 36
Hyde	1,752 18
Hyde Park High	3,945 90
Ira Allen	447 18
James A. McDonald	364 50
James Otis	1,446 25
Jefferson	1,570 10
John A. Andrew	1,227 80
John Boyle O'Reilly	497 07
John Cheverus	1,312 13
John G. Whittier	420 36
John L. Motley	122 59
John Winthrop	975 59
Joseph Tuckerman	1,421 23
Joshua Bates	678 25
Julia Ward Howe	1,162 15
Julia Ward Howe Annex	8 25
Lafayette	344 14
Lawrence	7,154 29
Leon Street Storehouse	257 42
Lewis	877 88
Little Em'ly	117 06
Longfellow	1,817 26
Louis Prang	534 21
Louisa M. Alcott	705 46
Lowell	854 24
Lowell Annex	108 40
Lucretia Crocker	242 64
Lyceum Hall	433 07
<i>Carried forward</i>	\$171,834 06

<i>Brought forward</i>	\$171,834 06
Lyman	1,341 79
Margaret Fuller	523 95
Marshall	634 09
Martin	715 09
Mary Hemenway	2,110 49
Mary Lyon	217 66
Mather	1,772 62
Mayflower	6 90
Mayhew	572 55
Mead Street	177 00
Mechanic Arts High	2,277 18
Medford Street	416 49
Miles Standish	847 11
Minot	1,875 56
Mt. Pleasant Avenue	210 05
Mt. Vernon Street	813 80
Nathan Hale	510 35
Nathaniel Hawthorne	1,621 81
Noble	300 07
Noble Annex	107 56
Norcross	5,895 38
Normal	1,319 40
Oak Square	47 71
Old Agassiz	189 09
Old Baker Street	125 40
Old Brighton High	12 50
Old Dearborn	556 73
Old East Boston High	127 90
Old Edward Everett	462 87
Old Gibson	791 11
Old Mather	571 24
Oliver Hazard Perry	707 42
Oliver Holden	222 03
Oliver Wendell Holmes	2,569 61
Parkman	799 88
Paul Jones	1,072 14
Paul Revere	1,630 13
Peter Faneuil	1,110 27
Phillips Brooks	2,727 75
Phillips Street	457 72
Phineas Bates	174 74
Pierpont	98 23
Plummer	879 67
Polk Street	183 53
Pormort	179 18
Prescott	1,336 80
Prescott Annex	142 40
Prince	571 05
<i>Carried forward</i>	\$213,848 06

<i>Brought forward</i>	\$213,848 06
Public Latin	3,245 62
Quincy	2,977 67
Quincy, Manual Training	20 00
Quincy Street	102 09
Rice	1,222 29
Richard Humphreys	705 07
Robert G. Shaw	1,100 31
Robert Swan	358 14
Roger Clap	2,943 67
Roger Wolcott	3,211 95
Roxbury High	1,718 63
Samuel Adams	996 79
Samuel G. Howe	3,608 29
Samuel W. Mason	1,375 02
Sarah J. Baker	456 42
Sarah J. Baker (Practical Arts High)	310 11
Savin Hill Primary	259 38
Savin Hill Avenue, No. 141	132 75
School Street	1,326 38
Sharp	838 43
Sherwin	2,541 70
Shurtleff	4,957 88
Silver Street Storehouse	795 62
Simonds	83 62
Skinner	535 36
Smith Street	67 92
Somerset Street	663 25
South Boston High	5,707 18
Stephen M. Weld	1,045 71
Stoughton	583 73
Tappan	558 90
Thomas Gardner	1,858 21
Thomas N. Hart	1,277 18
Thornton Street	18 12
Tileston	457 62
Trade School for Girls	3,626 46
Trescott	467 51
Tyler Street	195 07
U. S. Grant	236 34
Union Street	12 50
Wait	605 10
Walnut Street	806 34
Warren	1,973 99
Washington	2,912 20
Washington Allston	1,028 52
Washington Allston Annex	2,452 34
Washington Street (Forest Hills)	242 89
Washington Street (Germantown)	74 00
<i>Carried forward</i>	\$276,542 33

<i>Brought forward</i>	\$276,542	33
Way Street	171	15
Weld, Hyde Park	842	44
Wells	1,121	36
Wendell Phillips	1,741	71
West Roxbury High	2,299	75
William Bacon	858	64
William Bradford	52	72
William C. Bryant	962	97
William E. Endicott	776	26
William Eustis	558	26
William E. Russell	1,925	61
William H. Kent	557	01
William Lloyd Garrison	1,104	66
William Wirt Warren	465	86
Williams	196	29
Winchell	375	02
Winship	754	11
Winthrop Street	14	16
W. L. P. Boardman	401	82
Wyman	385	64
Administration and incidental expenses	56,584	04
Portable buildings (111)	14,260	27
School Committee Building	2,426	91
Castle Island	9	50
Wareham street, No. 11	121	35
Warrenton street, No. 25	1,188	05
Old Franklin	30	10

Hired Buildings, Rents, Taxes and Repairs.

Barham Memorial Church	629	00
Beech street lot, Roslindale	125	00
Boylston street, No. 48	1,664	13
Boylston street, No. 480	458	25
Chambers street, No. 38 (St. Andrew's Chapel),	1,162	64
Chambers street, No. 103	1,700	97
Chelsea street, No. 18	279	72
Dover street, No. 23	162	70
East Fourth street, No. 484	660	83
Eliot street, Jamaica Plain (Trustees' Building),	425	15
Florence street, No. 13	138	45
Franklin Union	3,292	57
Greenwood Hall	617	50
Hanson street	414	74
Hull street, No. 24	864	65
Hyde Park Young Men's Christian Association,	47	75
Lauriat avenue, No. 170	644	00
Mechanics Building	6,390	59
Moon street	1,282	67

Carried forward \$387,689 30

<i>Brought forward</i>	\$387,689 30
Parmenter street, No. 20	1,000 00
Perrin street, No. 6	325 00
Saratoga street, No. 66	55 01
Saratoga street, No. 399	303 00
Terrace street, No. 29	641 00
Tileston street, No. 52	1,207 18
Tremont street, No. 168	2,331 81
Tremont street, No. 563	3,110 39
Walnut avenue kindergarten	655 67
Waterford street, No. 6	205 00
Waterford street, No. 11	1,476 64
Total	<u>\$399,000 00</u>

IV.

STATEMENT OF INCOME.

Received from sale of old furniture, etc.	<u>\$188 48</u>
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APPENDIX III.

 APPROPRIATION HIGH SCHOOL OF COMMERCE
AND SCHOOL ADMINISTRATION BUILDING.

Appropriation 1909-10	.	.	.	.	.	.	\$50,000 00
Appropriation 1910-11	.	.	.	.	.	.	300,000 00
Appropriation 1911-12	.	.	.	.	.	.	250,000 00
							<hr/>
Total	.	.	.	.	.	.	\$600,000 00
<i>Expenditures:</i>							
Site	.	.	.	.	.	.	\$25,646 82
Architect's services	.	.	.	.	.	.	26,583 52
							<hr/>
							52,230 34
							<hr/>
<i>Balance of appropriation February 1, 1913</i>	.						<u>\$547,769 66</u>

APPENDIX IV.

HIRED BUILDINGS.

I.

Rooms in the following buildings have been hired for school purposes; rents, taxes, water rates, heating, lighting and janitors' expenses paid for the same, amounting to \$27,260.06 during the year from February 1, 1912, to February 1, 1913:

For	Location.	Remarks.
Comins District *.....	Terrace street, 29, house....	Rent per annum \$600, from Aug. 16, 1909. City to furnish heat and janitor's service.
Continuation School.....	Young Men's Christian Union Building, 48 Boylston street.	Rent per annum \$2,260, from Sept. 13, 1911, including heat, light and janitor's service.
English High School.....	Tremont street, 563.....	Rent per annum \$2,000, from July 1, 1910, including heat, light and janitor's service.
English High School.....	Franklin Union, Berkeley and Appleton streets.	Rent per annum \$3,600, from Sept. 16, 1912, including heat and janitor's service.
Emerson District, Primary Class,	Saratoga street, 399.....	Rent per annum \$300, not including heat or janitor's service.
Eliot District, two special classes,	Hull street, 24.....	Rent per annum \$420. City to furnish heat and janitor's service.
Eliot District, Continuation School.	Tileston street, 52.....	Rent per annum \$600, including heat, light and janitor's service.
Franklin District, Kindergarten..	Dover street, 23.....	Rent per annum \$480, including heat, light and janitor's service.
Franklin District, Cooking Room,	Hanson street, 1.....	Rent per annum \$360, from Sept. 1, 1911, including heat and janitor's service.
George Putnam District, Kindergarten.	Walnut avenue.....	Rent per annum \$600, including heat and janitor's service.

* Vacated during the year.

HIRED BUILDINGS.— *Continued.*

For	Location.	Remarks.
Girls' High School.....	Jordan Hall, Huntington avenue.	Used for graduation exercises June 20, 1912. Rent for same \$45.
Hancock District.....	Moon street.....	Rent per annum \$1,200, including heat and janitor's service.
Hancock District, Grammar and Special Classes.	Parmenter street, 20.....	Rent per annum \$1,000, from Oct. 25, 1909, including heat, light and janitor's service.
Horace Mann District, Pre-vocational Class.	Boylston street, 480.....	Rent per annum \$900, including heat and elevator service.
High School of Practical Arts*...	Perrin street, 6.....	Rent per annum \$576, from June 1, 1910. City to pay water rates.
High School of Commerce.....	Massachusetts Charitable Mechanics Association, Mechanics Building.	Rent per annum \$6,000, from Aug. 1, 1909, including heat. City to pay water rates.
Hyde Park High School.....	Young Men's Christian Association Gymnasium.	Rent per annum \$100, includes all expenses.
John A. Andrew District.....	Barham Memorial Church, corner Dorchester and Vinton streets, South Boston.	Rent per annum \$600, from Oct. 28, 1909, including heat and janitor's service.
Longfellow District, Primary Classes.	Beach street, Phineas Bates Portable Building, 12.	Rent per annum \$125, for use of land only.
Lyman District, Domestic Science Class.*	Chelsea street, 18.....	Rent per annum \$300, from Nov. 1, 1910, including heat and janitor's service.
Manual Training School.....	Eliot street, Jamaica Plain..	Rent per annum \$420, from Feb. 1, 1911, including heat and janitor's service.
O. W. Holmes District, Kindergarten Class.	Greenwood Hall, Glenway street, Dorchester.	Rent per annum \$600, from Sept. 1, 1911, including heat, light and janitor's service.
Quincy District, Primary Class...	Florence street, 13.....	Rent per annum \$420, including light, heat, water and janitor's service.
Roger Wolcott District, Kindergarten and Primary Class.*	Lauriat avenue, 170, Dorchester.	Rent per annum \$1,200, including heat, water and janitor's service.
School Committee.....	Waterford street, 6.....	Rent per annum \$180.
School Committee.....	Waterford street, 11.....	Rent per annum \$1,650, including heat, use of elevator and water tax.
School Committee.....	Tremont street, 168, fifth floor.	Rent per annum \$1,920, from March 1, 1909, including heat. City to furnish janitor's service.

* Vacated during the year.

HIRED BUILDINGS.— *Concluded.*

For	Location.	Remarks.
Shurtleff District, Kindergarten and Cooking Room.*	East Fourth street, 484, South Boston.	Rent per annum \$600, not including heat, water or janitor.
U. S. Grant District, Special Class,	Saratoga street, 66.....	Rent per annum \$240. City to furnish janitor, heat, light and water.
Washington District, Special and Ungraded Class.	Chambers street, 103.....	Rent per annum \$1,620, from Oct. 10, 1907, including heat and janitor's service.
Wells District, Kindergarten and Grammar Classes.	Chambers street, 38.....	Rent per annum \$1,080, including heat, janitor and water rates.

* Vacated during the year.

II.

SUBDIVISION OF EXPENDITURES.

Amounts paid from appropriation for rents and taxes for each hired building during the year 1912-13:

Barham Memorial Church	\$600 00
Beech street lot	125 00
Boylston street, 48	1,301 67
Boylston street, 480	375 00
Chambers street, 38 (St. Andrew's Chapel)	1,080 00
Chambers street, 103	1,620 00
Chelsea street, 18 *	275 00
Dover street, 23	160 00
East Fourth street, 484 *	500 00
Eliot street, Jamaica Plain (Trustees' Building)	420 00
Florence street, 13	105 00
Franklin Union	3,221 67
Greenwood Hall	600 00
Hanson street, 1	360 00
Hull street, 24	245 00
Hyde Park Gymnasium	130 00
Jordan Hall	45 00
Lauriat avenue, 170 *	600 00
Mechanics Building	6,168 15
Moon street	450 00
Parmenter street, 20	1,000 00
Perrin street, 6 *	295 00
Saratoga street, 66	26 00
Saratoga street, 399	300 00
Terrace street, 29 *	625 00
Tileston street, 52	540 00
Tremont street, 168	1,895 00
Tremont street, 563	2,029 40
Walnut avenue	631 67
Warrenton street, 25	15 00
Waterford street, 6	120 00
Waterford street, 11	1,237 50
West Newton street, German Lutheran Church	164 00
	<hr/>
	\$27,260 06

* Vacated during the year.

APPENDIX V.

Table Showing Cost of Buildings, Cost per Cubic Foot, Children Accommodated and Cost per Pupil.

NAME OF SCHOOL BUILDING.	Grade.	Building, Heating, Plumbing, and Electrical Contracts.	Total Cost of Building.	PERCENTAGE CONTRACTS BEAR TO TOTAL COST OF BUILDING.				Cubical Contents.	Cost per Cubic Foot.	PROPORTION CONTRACTS BEAR TO COST PER CUBIC FOOT.				Cubic Feet.	Children Accommodated.	Cost per Pupil.
				Bldg.	Heat.	Plumb.	Elec.			Bldg.	Heat.	Plumb.	Elec.			
Marshall.	P.	B., \$106,516 75	\$124,467 65	Per Ct.	85	Per Ct.	8	Per Ct.	4	Per Ct.	3			37,000	700	\$177 81
		H., 9,483 00														
		P., 5,197 00														
William F. Russell.	G.	E., 3,270 90												50,000	900	209 47
		B., \$158,180 52														
		H., 15,132 40														
Farnagut.	P.	P., 9,580 29	188,524 56											24	21	209 47
		E., 5,622 35														
		B., \$127,262 98														
Paul Jones.	P.	H., 12,432 00	150,526 43											23	19	215 04
		P., 6,821 45														
		E., 4,010 00														
Ellis Mendell.	P.	B., \$95,085 75	114,370 35											22	18	163 39
		H., 10,376 00														
		P., 5,324 00														
Jefferson.	G.	E., 3,574 60	122,267 20											24	20	203 78
		B., \$103,569 20														
		H., 9,625 04														
Washington.	G.	P., 5,658 11	210,890 49											24	20	221 99
		E., 3,414 85														
		B., \$182,201 94														
Washington.	G.	H., 16,927 15	325,541 60											25	20	217 03
		P., 6,449 90														
		E., 5,251 50														
Washington.	G.	B., \$263,661 16												43,000	1,500	217 03
		H., 28,305 94														
		P., 21,417 05														
Washington.	G.	E., 12,157 45														
		B., \$263,661 16														
		H., 28,305 94														
		P., 21,417 05														
		E., 12,157 45														

Christopher Columbus	P.	B., \$136,966 08 H., 16,244 00 P., 15,519 00 E., 4,783 00	79	9	9	3	727,068	23	18	2	2	1	30,000	1,200	144 59
John Boyle O'Reilly	P.	B., \$95,712 50 H., 10,227 00 P., 4,040 00 E., 2,859 50	85	9	4	2	450,248	25	21	2	1	1	32,000	700	161 20
Oliver Hazard Perry	G.	B., \$118,497 38 H., 17,621 50 P., 5,094 00 E., 4,932 75	81	12	4	3	612,351	24	19	3	1	1	44,000	700	208 78
Mather	G.	B., \$241,098 44 H., 27,807 00 P., 11,613 50 E., 8,782 05	83	10	4	3	1,353,831	21	17	2	1	1	42,000	1,600	180 83
Thomas Gardner	G.	B., \$113,769 15 H., 15,994 04 P., 6,038 00 E., 4,466 38	81	12	4	3	735,573	19	15	2	1	1	52,000	700	200 38
Oliver Wendell Holmes	G.	B., \$159,563 85 H., 21,930 18 P., 8,037 00 E., 6,116 99	81	12	4	3	991,609	20	16	2	1	1	41,000	1,200	163 04
Samuel W. Mason	P.	B., \$99,527 64 H., 10,447 00 P., 4,990 00 E., 3,360 00	84	9	4	3	438,223	27	23	2	1	1	31,000	700	169 03
Dearborn	G.	B., \$182,240 82 H., 20,874 00 P., 8,929 50 E., 5,087 00	84	9	4	3	980,100	22	18	2	1	1	47,000	1,050	206 66
John Greenleaf Whitier, P.	P.	B., \$61,053 55 H., 7,540 70 P., 3,551 00 E., 2,590 90	82	10	5	3	325,051	23	19	2	1	1	32,000	500	149 47

Table Showing Cost of Buildings, Cost per Cubic Foot, Children Accommodated and Cost per Pupil. — Continued.

NAME OF SCHOOL BUILDING.	Grade.	Building, Heating, Plumbing and Electrical Contracts.	Total Cost of Building.	PERCENTAGE CONTRACTS BEAR TO TOTAL COST OF BUILDING.				Cubic Contents.	Cost per Cubic Foot.	PROPORTION CON- TRACTS BEAR TO COST PER CUBIC FOOT.				Cubic Feet, Class-room.	Children Accommodated.	Cost per Pupil.
				Bldg.	Heat.	Plumb.	Elec.			Bldg.	Heat.	Plumb.	Elec.			
James Otis.....	P.	B., \$90,867 00 H., 8,767 00 P., 4,889 00 E., 3,295 00	\$107,818 00	Per Ct.	Per Ct.	Per Ct.	Per Ct.	411,645	26	22	2	1	1	31,000	600	\$179 70
Joseph Tuckerman.....	P.	B., \$61,875 79 H., 8,422 00 P., 4,226 70 E., 2,898 76		84	8	4	4									
William E. Endicott.....	P.	B., \$64,745 25 H., 7,951 00 P., 3,667 91 E., 2,693 61	77,423 25	80	11	5	4	330,171	23	18	3	1	1	33,000	500	154 85
Sarah J. Baker.....	P.	B., \$130,016 23 H., 18,673 00 P., 7,625 00 E., 4,880 00	79,057 77	82	11	4	3	348,883	23	18	3	1	1	35,000	500	158 11
Nathaniel Hawthorne....	P.	B., \$54,682 82 H., 7,518 00 P., 3,100 00 E., 2,611 25	161,194 23	81	11	5	3	702,384	23	18	3	1	1	29,009	1,200	134 32
Charlestown High.....	H.	B., \$253,157 94 H., 18,711 25 P., 13,970 00 E., 10,216 00	67,912 07	80	11	5	4	281,305	24	19	3	1	1	31,000	450	150 92
			296,055 79	86	6	5	3	1,267,608	23	19	2	1	1	.....	540	548 25

NORMAL AND LATIN GROUP.																																																																																		
Common Building..... Normal School.....	H.	B., \$276,559 15	329,237 08	84	8	4	4	1,392,848	23	19	2	1	1	350	940 65																																																																		
	H.	H., 26,338 97		297,116 39	84	8	4	4	1,388,807	23	19	2	1	1	600	495 19																																																																	
	P.	P., 13,169 48																																																																																
	E.	E., 13,169 48																																																																																
Girls' Latin.....	H.	B., \$249,577 77	176,663 79															84	8	4	4	725,561	23	19	2	1	1	850	207 84																																																				
	H.	H., 23,769 31		107,515 43	77	15	4	4	516,678	21	16	3	1	1	32,000	560	191 99																																																																	
	P.	P., 11,884 66																																																																																
	E.	E., 11,884 65																																																																																
Patrick A. Collins.....	G.	B., \$148,397 59	67,231 82															81	10	5	4	333,379	20	16	2	1	1	28,000	480	140 08																																																				
	H.	H., 14,133 10		102,706 35	78	12	5	5	535,474	19	15	2	1	1	30,000	704	145 89																																																																	
	P.	P., 7,066 55																																																																																
	E.	E., 7,066 55																																																																																
Edward Everett.....	G.	B., \$82,868 43	108,079 50															84	8	4	4	431,886	25	21	2	1	1	24,000	760	142 21																																																				
	H.	H., 15,542 00		134,832 65	82	9	5	4	580,869	22	18	2	1	1	700	192 62																																																																	
	P.	P., 4,665 00																																																																																
	E.	E., 4,440 00																																																																																
Nathan Hale.....	P.	B., \$54,599 35	280,088 43															82	9	5	4	1,158,533	24	20	2	1	1	28,963	1,832	152 88																																																				
	H.	H., 6,682 00		John Cheverus.....	G.	B., \$80,268 04	H., 11,975 00	P., 5,040 31	E., 4,793 00	B., \$91,333 05	H., 7,977 00	P., 4,485 95	E., 4,283 50	B., \$110,996 60	H., 12,933 00	P., 6,170 37	E., 4,762 68	B., \$229,396 85	H., 24,097 58	P., 15,381 00	E., 11,213 00																																																													
	P.	P., 3,397 47																																																																																
	E.	E., 2,553 00																																																																																
Peter Faneul.....	P.	B., \$80,268 04	Dorchester High Addition																			H.	B., \$110,996 60	H., 12,933 00	P., 6,170 37	E., 4,762 68	B., \$229,396 85	H., 24,097 58	P., 15,381 00	E., 11,213 00	B., \$276,559 15	H., 26,338 97	P., 13,169 48	E., 13,169 48	B., \$249,577 77	H., 23,769 31	P., 11,884 66	E., 11,884 65	B., \$148,397 59	H., 14,133 10	P., 7,066 55	E., 7,066 55	B., \$82,868 43	H., 15,542 00	P., 4,665 00	E., 4,440 00	B., \$54,599 35	H., 6,682 00	P., 3,397 47	E., 2,553 00	B., \$80,268 04	H., 11,975 00	P., 5,040 31	E., 4,793 00	B., \$91,333 05	H., 7,977 00	P., 4,485 95	E., 4,283 50	B., \$110,996 60	H., 12,933 00	P., 6,170 37	E., 4,762 68	B., \$229,396 85	H., 24,097 58	P., 15,381 00	E., 11,213 00																
	Abraham Lincoln.....	G.		B., \$276,559 15	H., 26,338 97	P., 13,169 48	E., 13,169 48	B., \$249,577 77	H., 23,769 31	P., 11,884 66	E., 11,884 65	B., \$148,397 59	H., 14,133 10	P., 7,066 55	E., 7,066 55	B., \$82,868 43	H., 15,542 00	P., 4,665 00	E., 4,440 00	B., \$54,599 35	H., 6,682 00																																														P., 3,397 47	E., 2,553 00	B., \$80,268 04	H., 11,975 00	P., 5,040 31	E., 4,793 00	B., \$91,333 05	H., 7,977 00	P., 4,485 95	E., 4,283 50	B., \$110,996 60	H., 12,933 00	P., 6,170 37	E., 4,762 68	B., \$229,396 85	H., 24,0

Table Showing Cost of Buildings, Cost per Cubic Foot, Children Accommodated and Cost per Pupil. — *Concluded.*

NAME OF SCHOOL BUILDING.	Grade.	Building, Heating, Plumbing and Electrical Contracts.	Total Cost of Building.	PERCENTAGE CONTRACTS BEAR TO TOTAL COST OF BUILDING.				Cubical Contents.	Cost per Cubic Foot.	PROPORTION CON- TRACTS BEAR TO COST PER CUBIC FOOT.				Children Accommodated.	Cost per Pupil.
				Bldg.	Heat.	Plumb.	Elec.			Bldg.	Heat.	Plumb.	Elec.		
William Lloyd Garrison,	G.	B., \$51,950 30 H., 6,688 00 P., 3,823 18 E., 3,690 00	\$66,151 48	Per Ct.	Per Ct.	Per Ct.	Per Ct.	275,640	Cents. 24	Cents.	20	1	1	452	\$146 35
Girls' High Addition....	H.	B., \$97,396 70 H., 9,716 50 P., 3,274 39 E., 4,075 00		79	10	6	5			Cents.	2	1	1	27,564	
				84	9	3	4			Cents.	18	1	1	.....
Samuel Adams.....	G.	B., \$84,553 84 H., 11,701 50 P., 5,668 00 E., 5,595 00	114,462 59	79	11	5	5	481,016	22	18	2	1	1	400	286 16
Lafayette*.....	P.	B., \$51,234 56 H., 5,321 34 P., 3,544 84 E., 2,703 50	107,518 34	79	11	5	5	481,016	22	18	2	1	1	640	167 99
John Lothrop Motley...	P.	B., \$18,395 25 H., 2,310 00 P., 1,205 00 E., 600 00	62,804 24	82	8	6	4	220,000	28	23	2	2	1	352	178 42
Charles Bulfinch.....	P.	B., \$64,545 73 H., 6,980 00 P., 3,900 00 E., 3,500 00	22,510 25	81	10	6	3	99,445	23	18	2	1	1	176	127 89
George T. Angell.....	P.	B., \$45,153 50 H., 5,000 00 P., 2,900 00 E., 2,101 00	78,925 73	82	9	5	4	365,368	22	18	2	1	1	540	146 16
			55,154 50	81	9	6	4	208,762	26	21	2	2	1	352	156 69

John Windthrop.....	G.	B., \$87,073 54 H., 13,500 00 P., 5,300 00 E., 4,800 00	110,673 54	78	12	5	5	601,047	18	14	2	1	1	37,565	728	152 02
Mary Lyon.....	G.	B., \$49,760 26 H., 6,049 50 P., 3,450 50 E., 3,122 55	62,382 81	79	10	6	5	299,019	21	17	2	1	1	37,377	364	171 38
U. S. Grant *	G.	B., \$92,772 04 H., 13,500 00 P., 5,300 00 E., 4,800 00	116,372 04	78	12	5	5	592,171	19	15	2	1	1	32,898	828	140 55
Lewis.....	G.	B., \$85,416 29 H., 12,600 00 P., 4,600 00 E., 5,474 00	108,090 29	80	11	4	5	642,178	17	13	2	1	1	37,775	778	138 93
Benedict Fenwick.....	P.	B., \$49,356 45 H., 8,150 00 P., 3,331 00 E., 2,154 00	62,881 45	79	13	5	3	322,424	19	15	2	1	1	26,869	534	117 76
William Bradford.....	P.	B., \$32,638 04 H., 5,987 00 P., 2,700 00 E., 1,504 00	42,714 04	76	14	6	4	251,002	17	13	2	1	1	31,375	364	117 34
Roxbury High Annex *..	H.	B., \$62,677 39 H., 7,820 97 P., 7,784 80 E., 4,724 79	78,007 95	80	10	4	6	413,359	19	15	2	1	1	.....	200	390 04
Ellen H. Richards *.....	P.	B., \$34,118 06 H., 6,600 00 P., 2,400 00 E., 1,400 00	44,518 06	77	15	5	3	229,258	19	14	3	1	1	28,637	364	122 30
Mozart *	P.	B., \$17,680 00 H., 2,870 00 P., 1,816 00 E., 420 00	22,786 00	78	13	8	1	108,542	21	16	3	1.7	.3	27,133	160	142 41

* Cost to February 1, 1913.

NOTE.—Since 1909 rated number of pupils and cost per pupil are figured by actual seating capacity of building according to size of class-rooms. See Appendix XV. for date.

APPENDIX VI.

ARCHITECTS' SERVICES.

Every architect employed by the Schoolhouse Commissioners of the City of Boston as the Architect for erecting a building is to perform the duties hereinafter provided.

SECTION 1.— *The Board*.— (a.) Is to furnish the Architect with the requirements and information for the design and construction of the building for which he is the Architect, and give the approximate cubical contents and proposed cost per cubic foot thereof;

(b.) Is to provide the services of domestic engineers to confer with the Architect during the preparation of preliminary studies, and when these are accepted by the Board to advise the Architect in the details of their work, and make the necessary working drawings and specifications for (excepting plumbing), and have the direction of, the plumbing, heating, ventilating and electric work for the building, said work being hereinafter designated as the domestic engineering;

(c.) Is to give the grade and lines of streets and adjoining lots;

(d.) Is to give all information regarding the lot, and on request of the Architect, or of any person doing work on the building, furnish him full information relating to the above, the sewer, water, gas and electric service, and to the rights, restrictions and boundaries of the lot on which the building is to be constructed.

SECT. 2.— *The Architect*.— (a.) Is to consult and advise with the Board and make such preliminary studies as will acquaint the Board with the contemplated arrangement, design, construction and cubical contents of the building, and enable it to agree with the Architect upon a definite limit of cost therefor, and to accept said preliminary studies as the basis of working drawings and specifications;

(b.) Is to make upon the basis of said preliminary studies one complete set of working drawings in ink on tracing cloth, floor and framing plans, sections and elevations at one-eighth scale, plumbing drawings and such detail drawings on a larger scale as are necessary to explain the specifications;

(c.) Is to furnish one complete typewritten set of specifications for everything, including plumbing, to be furnished or done in constructing the building, except the domestic engineering, and is to revise and correct the printer's proofs;

(d.) Is to loan to the Board, to make blueprints therefrom, the said set of working drawings;

(e.) Is to restudy, and if necessary redraw, without charge, any or all of said drawings and specifications, if, owing to an unwarranted departure from the approved preliminary studies or to a needlessly extravagant or elaborate interpretation of them in said drawings and specifications, the lowest bid for doing the work in accordance therewith overruns the limit of cost agreed upon by the Architect and the Board;

(f.) Is, upon the signing of contract, to deliver to the Board, to remain their property, two sets of blueprints, mounted on cloth, taken from the said set of working drawings, a perspective drawing of the exterior of the building and such floor plans as the Board may request, suitable for reproduction, and at the conclusion of the work a complete set of working drawings on tracing cloth, either the set previously referred to or a copy therefrom, which shall be corrected to agree with and embody all changes made during construction;

(g.) Is to make application for a building permit to the Building Department on a form signed by the chairman of the Board, and deliver to the Building Department two sets of such blueprints from the said set of working drawings as may be required by the Building Department (the Board furnishing specifications to the Building Department);

(h.) Is to have general supervision of the domestic engineering and be the Architect of all other work to be done under any written contract for the construction of the building, and render the full usual Architect's services and supervision for such other work;

(i.) Is, in the form prescribed by the Board, to make all estimates and allowances for payments under any contract in which he is made the Architect of the work, and such estimates for the domestic engineering are to be accompanied by certificates of said engineers as to their accuracy;

(j.) Is to advise with the Board on any changes in the building contemplated by the Board, and is to order changes when required by the Board so to do;

(k.) Is to cause the drawings and specifications furnished by him to conform to all regulations of law and public authorities, and to be in accordance with established methods of building construction, faithfully carry out all the foregoing provisions, use all proper knowledge, skill and care therein, and be accountable for any failure so to do.

SECT. 3.—(a.) The city, as full compensation for the services aforesaid, is to pay the Architect 3 per cent upon the cost of the domestic engineering, exclusive of plumbing, and 6 per cent upon the cost of all other work;

(b.) Payments to be made as follows: 3 per cent upon all contracts other than those for domestic engineering is to be paid on the signing of such contracts, and thereafter 3 per cent upon the value of the materials and labor, as specified in each esti-

mate for payment under the contract, is to be paid on the making of the estimate, until the full payment aforesaid is made, and if any thereof remains unpaid at the completion of the work it is then to be paid. When preliminary studies are completed, the value of the Architect's services to date shall be reckoned one-sixth of the estimated total commission; when working drawings and specifications are ready for contract, if for any reason the signing of contracts is delayed, the value of his services to date shall be reckoned at 3 per cent of cost based on allowance for building given by the Board to the Architect. If the Board discontinue the services of the Architect at any intermediate stage the value of his services shall be reckoned proportionately. Five per cent on cost of domestic engineering, exclusive of plumbing, and 10 per cent on other work will be paid to Architects on all changes and alterations made within or to existing buildings. Additions and extensions made outside of such buildings to be regarded as new work and the commission to be reckoned on that basis.

SECT. 4.—When for any reason other than those stated in section 2, paragraph (e), above, the Board shall set aside the whole or any part of an Architect's studies, drawings and specifications while retaining him to prepare corresponding new studies, drawings and specifications for the same school building, the city shall pay the Architect for the work thus set aside a sum not exceeding three times the actual cost of draughting, and the new work shall be paid for on a commission basis, as stated in section 3, above.

SECT. 5.—In the above agreement the term "building" is used to define not only the structure itself but all work in connection with it committed to the Architect by the order of the Board, as fencing, grading, roads, walks, planting, decorative painting and sculptural decoration.

APPENDIX VII.

GENERAL INFORMATION AS TO STANDARD REQUIREMENTS FOR SCHOOL BUILDINGS AND YARDS.

YARDS.

(1.) *Grading.*—Grade the yards as determined after consultation with the commissioners.

(2.) *Fences.*—Provide fences, planting, etc., as determined after consultation.

(3.) *Gates.*—Provide the gates in fences inclosing the yards with hasp and staple to receive the Department Standard yard padlock, which will be furnished by the Department outside of the general contract.

(4.) *Play-yards.*—Play-yards located on the sunny side of the building are desired, and approximately 30 square feet per pupil should be provided. Play-yards are to be paved with hard-burned bricks, laid flat in sand and sloping at proper grades to catch-basins connecting to sewer.

(5.) *Walks.*—Pave the walks and approaches with hard-burned brick laid flat in sand.

(6.) *Curbs.*—Curbs forming borders may be paved with brick laid on edge. Bull-nose brick may be used for curbs.

(7.) *Sidewalks.*—Sidewalks for public use outside of the lot line and curbs for same are to be included in general contract for building as an allowance.

(8.) *Basement Entrances.*—Separate entrances are to be provided for boys and girls from their respective yards to the play-room. Areas, steps and inclines are to be avoided wherever possible. A separate entrance for janitor to boiler-room may be provided. A proper entrance for coal and exit for ashes should be provided.

(9.) *Driveways.*—Driveways such as for coal and ash teams are to be paved with vitrified pavers laid at the proper pitches, and in cement mortar on a sufficiently thick concrete base.

(10.) *Flagstaff*.— Provide a flagstaff with halliards, truck, etc., complete.

NOTE.— All the above items except as noted to be included in the general building contract.

ELEMENTARY SCHOOLS.

In General.— Elementary schools are subdivided into upper and lower. Lower includes Grades I., II. and III., and are to have 12-inch by 18-inch desks. The buildings for the lower grades are to have besides the class-rooms required, rooms for teachers, nurse, book storage and emergency closets. The upper elementary buildings are to contain Grades IV. to VIII., inclusive, and are to have besides the class-rooms required an assembly hall and rooms for master, teachers, nurse, book storage and emergency closets.

Grades IV., V. and VI. are to have 15-inch by 21-inch desks and Grades VII. and VIII. are to have 16-inch by 23-inch desks.

Desks are to be spaced according to standard seating plan.

THE BUILDING.

The building will be either "Lower Elementary," which includes class-rooms for Grades I., II. and III., or "Upper Elementary," which includes class-rooms for Grades IV. to VIII., inclusive. This will be determined by the Commissioners, who will act as an intermediary between architects and the school authorities and committee. Relations between commissioners, architects and contractors to be as defined by a contract. Commissioners are to determine the type of construction of the building.

Orientation.— It is desired to place the building so that each class-room should receive sunlight during some portion of the day.

Setting.— Set the building above grade so that the play-rooms are well lighted and entrances are provided into basement play-rooms as before mentioned. (See Basement Entrances.) Boiler-room floor wash to drain direct to sewer wherever possible.

Heat and Vent Flues.— To be of galvanized iron or masonry, as determined by the commissioners. If of masonry, to have joints neatly struck and the inner surface fairly smooth.

Fireproofing.— The ceiling of boiler-room and coal storage should be fireproof construction if these rooms are placed under class-rooms or

corridors. Doors for boiler-room and coal-pocket to be metal covered. Boiler-room to be self closing.

LOWER ELEMENTARY. This type of building, besides the required class-rooms, play-rooms, sanitaries, boiler, coal and janitor's rooms, should contain rooms for teachers, nurse and book storage; also emergency closets are to be provided as directed. To have kindergarten-room where so directed by commissioners. Closets should be provided for electrician as needed for batteries, switches, etc.

NOTE.— A paper burner should be provided in connection with the boiler-room as directed.

UPPER ELEMENTARY. This type of building, in addition to the requirements for the lower elementary, should contain an assembly hall with its necessary rooms, and a master's room with waiting-room if so directed. Rooms for cooking, manual training, etc., are to be provided when called for by the commissioners.

SCHOOL-ROOMS. (1.) *Size* will be 20 by 28 for lower and 20 by 30 for upper elementary grades and not less than 12 feet high in clear. Modification allowable only after consultation with the Board. Desks should be laid out on the preliminary plans. (See drawing.) The School Committee advise, and this Board has adopted, the policy of having a small portion of the rooms in a building, perhaps 10 or 20 per cent, of a size that will seat 50. Every class-room shall be consecutively numbered on the plans to designate it. These numbers to be for the doors, as noted below, and for the annunciator. Other rooms that appear on the annunciator to be named on the plans, as assembly hall, teachers' or master's room, cooking-room, manual training room. The kindergarten shall be counted as a class-room. In high schools both class and recitation rooms to be numbered, other rooms named.

(2.) *Windows* will be on the long side for left-hand lighting. The glass measured inside the sash shall contain not less than one-fifth of floor area, neither double run of sash nor double glazing nor weather strips will be required, the head square and close to the ceiling; the sill about 2 feet 6 inches from the floor where a gravity indirect system of heating is installed and 2 feet 11 inches where there is to be a plenum system; the windows divided

with muntins, no large sheets of glass. Finished with plastered jamb, no architrave, metal corner bead.

(3.) *Doors*.—One to corridor, 3 feet 6 inches by 7 feet, partly glazed, to open out, placed preferably near the teacher's end; (two doors may be desired under certain conditions); brass-plated steel butts, 4-lever mortise lock, master keyed; cast brass knobs, marble flush thresholds to corridors for first-class construction. Doors to have 2-inch, plain brass numbers, and cardholders, $3\frac{1}{2}$ inches by 5 inches, and hooks to hold open.

(4.) *Floors* will be maple.

(5.) *Walls* will be painted burlap up to top of blackboards, or of tack boards, and above this plaster tinted in water color,—a warm gray green or buff gives the best results,—the blackboards 4 feet high, 2 feet 2 inches from floor in kindergarten, 2 feet 4 inches to 2 feet 6 inches in Grade IV., and 2 feet 8 inches in Grade V. to VIII.; behind the teacher and on the long side. These will be of best black slate $\frac{1}{4}$ inch thick. At end, in place of blackboard, soft wood sheathing with burlap stretched over it with sewed seams for a tack board, to extend from base to the moulding at top of blackboards, to have wood strips to cover tacks. In lower grades a card rack covered with burlap is required above the blackboard only. A picture moulding at top of burlap, and also near ceiling in all rooms. (See drawings.)

(6.) *Ceilings* will be level, plaster tinted a light cream color. Ceiling angles square.

(7.) *Lights*.—Nine chain pendant electric fixtures on three switches. No gas.

(8.) *Heating and Ventilation*.—The inlet for heat about 5 square feet, the outlet for ventilation about 5 square feet.

(9.) *Bookcase*.—Provide a bookcase in any convenient position, capable of containing 300 octavo volumes (600 volumes in bookcases for upper grades); upper doors fitted with pin tumbler locks, and latch and knob; drawers fitted with pin tumbler locks and small brass pulls. Lower doors to have pin tumbler locks; same lock in each bookcase; all bookcase locks master keyed. (See drawing.) Special equipment for care of books where school is held day and evening is desired similar to that existing at the Charlestown

High School, so that the books of the day pupils will be put away in pigeonholes, leaving the desks free for evening use.

(10.) *Teacher's Closet*.—Provide a small closet for teacher's coat and hat, preferably opening from the class-room, but allowable from the wardrobe, closet to have about 6 hooks and one shelf.

(11.) *Fittings*.—Bulletin board and letter box should be included in general contract.

FRESH-AIR
ROOMS.

The School Committee is responding to the more general demand for fresh-air rooms for children who are anæmic or of tubercular tendencies. At present all that the Board is advising to meet this new demand is that a sunny room, preferably a corner room, be chosen for this work, and that the windows on one or on two sides be made casement, to open out, or arranged as the Board may direct; and that the heat be largely direct, so that the temperature can be quickly raised, if necessary, when the windows are closed. Otherwise these rooms will be the same as other class-rooms.

WARDROBES. (a.) (1.) *Size*.—Wardrobes will adjoin school-rooms and be from 4 feet 6 inches to 5 feet wide.

(2 and 3.) *Windows and Doors*.—Outside light, two doors, both connecting with school-room, and not to corridor, and having no thresholds. Doors, double swung, 2 feet 6 inches wide, brass double-acting butts, foot and hand plates, hooks or adjustable stops to hold open, ventilation under door farthest from vent.

(4.) *Floors*.—Terrazzo or composition, with border and base for first-class construction. For second-class construction, to have composition floor and base. For all cases, to have a drip gutter for umbrellas.

(5.) *Walls*.—Painted burlap to a height of 7 feet, poles on brass-plated iron brackets with hooks under and pins over, 44 in number; umbrella clips and drip gutter below. (See drawing.) Walls above, plaster, tinted. Height of lower pole, kindergarten, 30 inches from floor; lower grades, 36 inches to 40 inches; upper grades, 44 inches, 48 inches and 52 inches; distance between poles, 8 inches for elementary, 12 inches for high schools. Pins and hooks, 8 inches to 12 inches on centers for elementary and 16 inches to 18 inches for high. Each hook to have a painted number $1\frac{1}{4}$ inches

high. An individual compartment is desired for each pupil. The Commissioners are experimenting along this line at present.

(6.) *Ceiling*.—Plaster, untinted.

(7.) *Light*.—One lamp. Ceiling outlets, electric. Switch in class-room.

(8.) *Heating and Ventilation*.—Heating, direct. Ventilation, vent duct, $1\frac{2}{3}$ square feet area cross section.

CORRIDORS AND VESTIBULES.

(1.) *Size*.—Not less than 8 feet wide for four rooms on a floor; not less than 10 feet for over four rooms, governed by length, access to stairs, etc.

(2.) *Windows*.—Outside light essential.

(3.) *Doors*.—Main outer doors to open out, heavy butts, standard, master keyed, school lock; lock set to be furnished by the Department but set by the Contractor; door check; heavy hooks to hold open. Vestibule doors open out, heavy butts, pulls, push plates, hooks to hold open, door checks, no locks. Outer doors to basement open out, and fitted with standard latch lock. Other hardware as above.

(4.) *Floors*.—Terrazzo divided into areas not to exceed 80 square feet, by slate strips, and to have terrazzo or marble base for first-class construction. Wood floor and base second-class construction.

(5 and 6.) *Walls and Ceilings*.—A light glazed brick, untinted walls and ceilings. Put picture moulding at ceiling in corridors.

(7.) *Light*.—Ceiling or short pendant fixtures (electric), 32 candle power each, also gas for emergency in corridors, on stairs, and in vestibules.

(8.) *Heating and Ventilation*.—Heat direct, supplemented by foot warmers on first floor. Ventilation where possible.

(9.) *Sinks and Closets*.—On each floor above the first, one or two 4-foot sinks, with 2 fountains.

STAIRCASES.

(1.) *Number and Arrangement*.—Determined by the Board, and not over 5 feet wide.

(2.) *Material*.—The treads, North River stone on iron string, or concrete construction with granolithic surface for first-class construction; wood for second-class construction. Rails of a simple pattern, easily cleaned; wall rails are desired.

(3.) *Steps*.—About $6\frac{1}{2}$ or 7 inches by $10\frac{1}{2}$ inches. Rail not less than 2 feet 8 inches on runs and 3 feet on landings.

(4.) *Exits*.—Exits from the lower landings of stairs are desired. These may have emergency bolts where so desired.

SANITARIES.

(1.) *Size*.—General toilet-rooms in basement, in size approximating space for $1\frac{1}{8}$ water-closets for each school-room, *i. e.*, $\frac{5}{8}$ boys and $1\frac{1}{4}$ for girls, and 33 inches of urinal for every school-room, arranged for convenient supervision and circulation. Slate sinks, length from 10 inches per class-room in small buildings to 6 inches per class-room in large buildings, located preferably in the play-rooms. The above refers to mixed schools.

(2.) *Windows*.—Ample outside light; glazed where exposed to view outside with ribbed glass; to have wire guards.

(3.) *Doors*.—The doors arranged “in” and “out,” with spring or door check and stout brass hooks to hold open; glazed with ribbed glass; half doors to water-closets.

(4.) *Floors*.—Asphalt. Boys’ drained to urinal, girls’ to floor wash.

(5.) *Walls*.—Salt-glazed brick or other nonporous inexpensive surface, 7 feet high; above, brick painted.

(6.) *Ceiling*.—Untinted plaster or white-washed concrete. Basement ceiling need not be furred level for first-class construction. For second-class construction ceiling should be plastered.

(7.) *Light*.—Ceiling or short pendant electric fixtures.

(8.) *Heat and Ventilation*.—Heat direct. Ventilation through water-closets and space back of urinals, allow 10 square inches local vent for each water-closet and 8 square inches for each lineal foot of urinal.

PLUMBING FIXTURES.

(1.) *Water-closets*.—The pupils’ water-closets for elementary schools are wash down closets; siphon action, upper classes, $16\frac{1}{2}$ inches high; lower classes, $13\frac{1}{2}$ inches high. Teachers’ same with raised rear vent $16\frac{1}{2}$ inches high. (See drawing.)

(2.) *Partitions*.—To be $\frac{7}{8}$ -inch V-grooved hard wood sheathing applied vertically, with top and bottom rails of same wood, supported at ends with iron pipe about 8 feet high, tied

together and to the wall, to which doors are hung. Back partition of water-closets to be wood sheathing over a 2-foot slate base. Finish of wood (color) to match that of rest of building. (See drawing.)

(3.) *Urinals*.—The urinals will be of slate, floor slab, trough and back, with partitions where requested, flushed automatically from special tank, through $\frac{7}{8}$ -inch perforated pipe, with cold water; vented at bottom into space behind. (See drawing.)

(4.) *Sinks* of black slate, two self-closing cocks, and jet drinking fountains, set 20 inches on centres. A sink is desired for electrician unless there is one near by.

(5.) *Floor Washes* in sanitariums and play-rooms as already mentioned. (See drawing.)

(6.) *Piping*.—(a.) Cast iron must be laid on good footing in basement, clean-outs at every change of direction. Soils and vents exposed as far as possible, no asphaltum, red lead and three coats of paint.

(b.) *Supplies*.—Exposed as far as possible; where covered may be plain brass, elsewhere polished brass; no nickel plate. Hot water for janitor's use in basement, cooking-room, and for master's and teachers' rooms. Supply from boiler and from summer boiler, if any, or from an independent hot water heater. No auxiliary supply wanted for water-closet tanks.

(c.) *Fire Lines*.—In buildings over three stories high, one or more lines of 3-inch pipe if requested by the Board.

PLAY-ROOMS.

All free basement space to be arranged as play-rooms for boys and girls. Salt-glazed brick, 7 feet high, and painted or whitewashed brick or stone walls above. Granolithic floors, plaster ceilings or whitewashed concrete. Basement doors and windows to have wire guards in channel iron frames; guards to be hinged and padlocked. Doors are desired from the play-rooms to the play-yards. Areas at doors are not desired.

MASTER'S AND TEACHERS' ROOMS.

(1.) In each school of the upper grades a room of about 240 square feet for the master, with a water-closet and bowl and a book-closet adjoining. This room should be near the centre of the building, *i. e.*, on the second floor, in a three-story building. In all schools a room or rooms for teachers, averaging about 300 square feet for ten teachers, with one

water-closet and bowl. Doors to be clearly marked "Master" or "Teachers" in brass letters and one water-closet and bowl on each floor of six rooms for teachers' emergency.

(2.) Where men as well as women are teachers, a separate room with toilet accommodations for men.

(3.) Opportunity in teachers' rooms for warming luncheon, either gas or electric.

SPECIAL ROOMS.

ASSEMBLY HALLS.

Assembly halls should accommodate from 400 to 800. It is not considered necessary to seat the full number of pupils in schools of greater capacity. The floor to be level and of wood like class-rooms, or linoleum. The windows to be fitted with rebated mouldings to take black shades, and so designed as to make the operation of shades practical and simple. The platform should be capable of accommodating one, or, in the large schools, two classes, and should have removable stepped platforms of wood to take the benches. Galleries may be used where the hall is two stories in height. Anterooms near the platform are desirable, and a connection from adjoining class-rooms to the anterooms or directly to the platform. A dignified architectural treatment of the walls and a studied color scheme for walls and ceiling is expected. The lighting, acoustics and exits should be such as belong to a small lecture hall. Artificial lighting to be under control from at least two points, one of which must be near an exit. Electric outlet for 30-ampere projection lantern, 25 feet from curtain. Provide recess in ceiling over platform for spring-rolled curtain 13 feet long. For assembly hall an allowance in cubing is made by the Board of two class-rooms for schools of medium size, that is, about sixteen class-rooms, and four class-rooms for schools of larger size, *i. e.*, over twenty-four class-rooms to represent the added area for this purpose.

MANUAL TRAINING ROOMS.

(1.) *Size.*—Room, generally located in basement, if floor can be above grading, should be approximately 900–1,000 square feet, preferably a corner room, and the larger of the two allowed sizes of rooms, and arrangement shown by drawing, for number of benches there given, 25. In elementary schools for boys only 22 benches are sufficient.

(2.) *Light*.—The windows should be as near full length as possible and on two sides. Artificial light in chain pendant electric fixtures, one light to every four benches.

(3.) *Floors*.—Of wood.

(4.) *Walls*.—A basement room should be finished as a shop; salt-glazed brick up to 7 feet where exposed, and above blackboard brick walls whitewashed. If above basement, finished as a class-room.

(5.) *Ceilings*.—Like basement.

(6.) *Heating and Ventilation*.—The same as in class-rooms. If in basement provide some direct radiation.

(7.) *Fittings*.—(a.) *Stock-room*.—Stock-room should contain at least 80 square feet, preferably long and narrow. Eighteen-inch shelves should run around the room, 5 feet 6 inches and 6 feet 6 inches from the floor.

(b.) *Wardrobes*.—Wall space for 26 double coat and hat hooks, in a separate room.

(c.) *Teachers' Closets*.—Teachers' closet should be small for personal belongings, with shelving and hooks under.

(d.) *Storeroom*.—For finished work and hardware should be fitted with all shelving possible; an area 40 square feet is adequate. *

(e.) *Bookcases*.—Like those in class-rooms, 150 capacity.

(f.) *Work-rack*.—About 28 feet long, made in sections, 6 feet 6 inches high and 2 feet deep. The length is to take 24 compartments (equaling the number of benches) and the height the number of divisions that use the room (two each day, five days, outside limit). Compartments to have numbers and letters painted. (For all of these, see drawings.)

(g.) *Sink*.—A 3-foot soapstone sink, with hot and cold water, with drinking fountain if desired.

(h.) *Display Frames*.—Four display frames, size and position as indicated, of burlap over soft wood back, with 2-inch moulding around.

(i.) *Demonstration Steps*.—Demonstration steps are desired.

(j.) *Furniture*.—(Not included in the building contract.) The furniture comprises 25 benches and stools, teachers' desk, table 4 feet by $2\frac{1}{2}$ feet, with unfinished top, 1 desk chair and 2 common chairs, a clock. (See

drawing.) Lay these out on preliminary drawings. Lower benches to be set toward the front and nearer the windows.

(k.) *Blackboards*.—Provide about 15 running feet of slate blackboards, 4 feet high.

(l.) *Glue Pot*.—Provide electric or gas connections for same.

COOKING-ROOM.

(1.) *Size*.—Should have an area of 900-1,000 square feet, preferably a corner room on top floor, but generally in basement, and the larger of the two allowed sizes of room, and arranged for 24 stations.

(2.) *Light*.—Windows as in a class-room, if located in a corner, from two sides. Artificial light as in a class-room.

(3.) *Walls*.—Above basement, similar to school-rooms, blackboards, 4 by 10 feet, back of teacher's desk. Walls painted in oils. A basement room may have salt-glazed brick walls up to 7 feet and painted brick above. (See drawings.)

(4.) *Floors*.—The floor to be wood or linoleum, on cement, except space occupied by ranges, which is tiled.

(5.) *Ceilings*.—Ceilings like basement, or, if above basement, like class-rooms.

(6.) *Heat and Ventilation*.—Less heat is required than in a class-room, but the ventilation should be the same, with additional vent from the demonstration ranges. Hoods over ranges if Board so desires.

(7.) *Pittings*.—(a.) *Wardrobes*.—Provision for 24 pupils, double coat and hat hooks in separate lighted closet, and teachers' small closet.

(b.) *Work Benches*, accommodating 24 pupils, fitted with compartment for utensils, bread-board, etc., a Bunsen burner with a hinged iron grille over it, set on aluminum plate at each station; benches arranged in the form of ellipse, or oblong, with access to centre from two sides; top of pine 24 inches wide; open underneath and supported on pipe standards. One section detached and fitted as a demonstration bench; a clear space of 4 feet all around. Dining table (furnished under another contract) is to be set in centre. (See drawings.) Lay these out on preliminary drawings and include in final drawings and contract.

(c.) *Dresser*.—Ten feet long, in 3 sections, 4 adjustable shelves and glazed sliding, or

hinged doors at top; one set of 3 drawers and 2 cupboards on lower part. A shelf should be put in each cupboard about 12 inches from top.

(d.) *Fuel-box*.—In 2 compartments, each about 24 inches square and 30 inches deep, with hinged lids; small shelf in one section. Accommodations in the main coal-room for a supply of range coal and kindling wood.

(e.) *Bookcase*.—Similar to those provided in class-rooms.

(f.) *Sink*.—Soapstone, 4 feet long; 2 cold and 2 hot water cocks; soapstone drip shelves 24 inches long, at each end of sink, provided with grease trap. Sink should be near ranges.

(g.) *Hot Water Supply*.—(See instructions in plumbing.)

(h.) *Coal and Gas Ranges*.—A six-hole coal range and a similar gas range, with hood provided, and set on a hearth previously mentioned.

(i.) *Refrigerator*.—Will be a part of the furniture. Furnished under another contract.

SEWING-ROOM.

The following is a list of standard equipment adopted by the School Committee.

(Not to be included in the general contract for building.)

30 Portable tables (inserted yard measure).*

50 Chairs in girls' school*

and

30 In mixed schools, varying in height from 14 inches to 21 inches from floor.*

1 Glass show case about 8 feet long, 2½ feet or 3 feet wide.

1 Cutting table, 8 feet long, 3 feet wide and 2 feet 6 inches high, inserted yard measure, 3 drawers in table, blackboards, minimum of 30 square feet.

Closet for teachers' wraps.

Stationary washbowl with running hot and cold water.

1 7½-lb. electric iron.

1 4-lb. electric iron.

Standard box rack with box for each girl. (See drawing.)

1 Sewing machine for 500 or fewer girls.

KINDERGARTEN.

(1.) *Size*.—The rooms can be contained in the space of a class-room and wardrobe, but a slightly larger area, 800 to 900 square feet, is desirable, and preferably the larger of the two allowed sizes of room. They comprise a large room, a small room, a supply closet, a wardrobe

* Not required when no regular "sewing room" is available.

and a water-closet. The large room should take a 16-foot circle, regulation lines painted on the floor with at least 4 feet all around it. (See drawing.) The small room, about 200 square feet.

(2.) *Light*.— Windows should be as in a class-room, if on a corner, on both sides. Exposure should be sunny. Artificial light of the class-room type arranged for the different rooms.

(3.) *Doors*.— Door to corridor as in class-rooms. Wide doors should open from small room into large room.

(4.) *Floors*.— Wood or linoleum cemented onto concrete surface, with painted lines as above.

(5.) *Walls*.— As in class-rooms, with black-board as in lower grades.

(6.) *Ceilings*.— As in class-rooms.

(7.) *Heat and Ventilation*.— As in class-rooms.

(8.) *Fittings*. (a.) *Wardrobe*.— Hooks for 60, arranged as in ordinary wardrobes.

(b.) *Teachers' Closet*.— For clothing of two or three teachers.

(c.) *Toilet-room*.— Immediately adjoining with low-down seat and bowl or sink.

(d.) *Bookcase*.— As in lower grades.

NURSE'S ROOM.

(1.) *Size*.— From 200 to 400 square feet, according to size of school.

(2.) *Windows*.— Outside light as in class-rooms.

(3.) *Shades*.— Set to roll from window-sill upward. Not in building contract.

(4.) *Doors*.— One door to corridor, as in class-room, marked "Nurse's room."

(5.) *Walls*.— Upper two-thirds plaster, smooth finish, round corners, painted with light green oil paint. Lower one-third to floor, glazed white tile with sanitary base.

(6.) *Floor*.— Terrazzo, like corridors for first-class construction. Composition for second-class.

(7.) *Heat and Ventilation*.— As in class-rooms.

(8.) *Light*.— Pendant electrolier with special shade. Extra socket on body of fixture for hand portable.

(9.) *Nurse's Closet for Supplies*.— Size, 3 by 4; one shelf; 6 hooks for clothing.

(10.) *Bath Tub*.—Five-foot porcelain enameled iron, hot and cold water, where requested by Superintendent of Nurses.

(11.) *Bowl*.—Enameled iron, hot and cold water faucets with shampoo cock. Hot water must be available all the year.

(12.) *Stove and Clock*.—Gas or electric heater as in teachers' rooms, and a secondary clock.

(13.) *Fittings*.—(Not in building contract.)

(a.) *Cabinet*.—Oak finish medical cabinet, adopted as standard by Schoolhouse Commission.

(b.) *Stool*.—White enamel revolving stool.

(c.) *Table*.—Dressing table, white enamel frame, glass top and shelf; size, 16 to 20, rubber crutch tips.

(d.) *Filing Case for Nurse's Records*.—Oak finish, to hold 1,000 cards, 4 by 6; lock and key; guide cards.

(e.) *Writing Table*.—Oak finish, with drawer and lock; size, 20 by 30.

(f.) *Chair*.—Oak to match table.

(g.) *Couch*.—Flat frame oak, canvas adjustable top.

(h.) *Mirror*.—Size, $2\frac{1}{2}$ by 3, set over bowl.

HIGH SCHOOLS.

CLASS-ROOMS AND RECITA- TION-ROOMS.

High school class-rooms are laid out for classes of thirty-six or forty-two, generally the latter. A room 26 feet by 32 feet will accommodate forty-two high school desks. The larger class-rooms are to accommodate from sixty to eighty pupils; the larger number can be accommodated in a room 33 feet 8 inches by 43 feet. Recitation-rooms, which to a certain extent will be used also as class-rooms, should be about 16 by 26. These rooms, if equipped with continuous desks and seats as in a lecture-room, or with double desks, such as are to be used in the Charlestown High, would accommodate about thirty pupils each. Lay out desks in one room of each type on preliminary plans.

ASSEMBLY HALL. For a high school would not differ materially from that already described for elementary schools.

MASTER'S AND TEACHERS' ROOMS.

For accommodation of the principal there should be an outer office, that is, a waiting-room or reception-room, and an inner office, and rooms for both men and women teachers, which might well be concentrated in the neighborhood of the reception-room and the principal's room.

CHEMISTRY.

The Rooms in General Required.—Laboratory, separate from lecture-room, may be used as recitation-room, but better to use lecture-room and keep laboratory free from desks and demonstration table. Lecture-room, separate from laboratory, but easy of access, may be used for recitation; in that case should have facilities for demonstration. Combined lecture-room for physics and chemistry admissible. Three rooms for administrative purposes, store-room for dry chemicals and apparatus, room for storage of liquid chemicals and preparation of reagents, which may also be used as a teacher's laboratory and an office. The total area of the laboratory and administration rooms should be about 1,200 square feet and of the lecture-room about 600 square feet.

CHEMICAL
LABORATORY.

(1.) *Size.*—Should accommodate a class of forty to fifty pupils, with apparatus. Accommodation for three such classes.

(2.) *Light.*—On two sides.

(3.) *Heating and Ventilation.*—On same basis as for class-rooms, but removal of gases should also be provided for by a hood, each compartment of which should be ventilated by 9-inch hole at top, venting into elbow or T of drain pipe, thence connected by drain pipe into main flue, in which should be a fan operated by a motor.

(4.) *Walls and Ceiling.*—Walls of brick ideal, but not generally feasible, except on outside walls; plaster walls painted in oils and ceiling of plaster, covered with water-resisting surface containing no lead. All woodwork to have natural finish, except tops of desks.

(5.) *Floor.*—Preferably of concrete; may be of hardwood in narrow strips, filled in by asphalt; should slope very slightly between desks, interspaces again trending to common corner, which may be drained.

(6.) *Equipment.*—Working desks at right angles to greater length of room, in sections back to back between windows; sections movable when top is removed. Each section 21 feet to 24 feet 6 inches long, 2 feet wide, 3 feet to 3 feet 2 inches in height. Distance between double sections about 5 feet, same distance at least between ends of sections and hood, which should be opposite longer line of windows and at right angles to direction of desk sections.

Other ends of sections near enough to wall to allow for drain at right angles to sections and under windows. Desks to be of ash or any durable wood, natural finish. Top of narrow pine strips, treated with aniline black and waterproof lead finish. Individual desks provided with 3 lockers and 3 sets of drawers each, each set of drawers operated by bar from locker, combination lock to fasten locker. Each double section of desks provided with soapstone sink, placed between sections and flush with section top, which should slope slightly to sink.* Sink 8 inches wide at least, and should begin within 1 foot of the end, toward hood, depth here to be 6 inches, running nearly to other end, where depth should be 8 inches. Each pupil to have working space of 3 feet 6 inches by 1 foot 8 inches. Each double section of desks provided with shelf for reagents, running length of desk, 10 inches to 12 inches above desk, supported by metal standards at suitable intervals, of white wood, $1\frac{1}{4}$ inches thick, 9 inches wide, natural finish, covered with glass plates, $\frac{1}{4}$ inch thick, 9 inches wide, suitable lengths, clamped to wooden shelf with as few clamps as possible. Wooden shelf at free end of each section, 1 inch to $1\frac{1}{2}$ inches thick, 3 feet to 4 feet long, not over 1 foot 3 inches wide, height of 2 feet 8 inches to 2 feet 10 inches, for holding blast lamps, reagent jars, etc. Finish off top of shelf in aniline black. Floor space under second row of windows taken up with line of extra desks, built like sections, furnished in similar way, but without necessarily a drain to be used for emergency or general utility. Wall space not otherwise occupied may be used for shelves or cabinets. Fixed slate blackboards at end opposite second set of windows and parallel to desk sections, sliding slate blackboards above hood. Liquid waste may be thrown into desk sink, dry waste into earthen jars. Hood should run at right angles to desk sections and along wall opposite free ends of sections. In the construction of hood, protection against fire should be considered. Should be built against brick wall. Floor of hoods to be of slate; wood, inside and outside, to be finished natural. Space divided into

* Individual sinks are preferred by the teachers, although the long trough is apparently adequate for teaching elementary chemistry, and is less expensive.

three or four compartments, closed by sliding windows. Space against wall not occupied by hood for general link.

(7.) *Gas*.—Lead from gas main at free end of centre of double desk sections, branch into two leads along back of each section. Take-offs between each working desk space in form of pillar with two $\frac{1}{4}$ -inch cocks, at each end desk a single cock. Two $\frac{1}{4}$ -inch gas nipples at each side of each compartment of hood. Cocks of these outside of hood. Wall desk fitted with single gas taps at intervals of two feet.

(8.) *Water*.—Lead from water main at free end of centre of double desk sections. Size, large enough to fill section sink rapidly. Lead of ordinary size along length of section underside of shelf, take-off at free end of section, to which blast and suction pump may be attached. At junction of each four working desk spaces take-off, carrying two valves with hose bibb delivery $\frac{1}{4}$ -inch, the two valves or cocks facing opposite sides. Suction pump attached to these bibbs if desired.

(9.) *Drains*.—Section desk sink to have open drain and mercury arrester, into which should be set movable concave netting of wide mesh to arrest larger solid matter. Main desk drain at right angles to sections along and under windows, between windows and sections should be in form of wooden trough, in sections dovetailed from 6 inches to 8 inches inside diameter and equally deep, covered with asphalt paint or filling; may be supported on brackets against wall and left open, or covered and provided with movable top. Into this drain will drip the lead pipes coming from section sink. Slate floor of each hood compartment should deepen slightly in centre, where there should be a hole 1 inch in diameter, into which is fitted short lead drain pipe, closed by perforated plug; drain pipes to be connected with sloping drain pipe, open or closed, running toward and delivering into general sink.

(10.) *Electricity*.—Current of electricity on section desks need not exceed ten volts, may be supplied from source common to physical and chemical side. Plugs between each working space placed under desk top on frame.

(1.) *Size*.—Area to depend on number of seatings required or number of pupils in classes; should be large enough for two classes

and should occupy a position between the laboratories for physics and chemistry.

(2.) *Light*.—As much glass area as classroom, preferably from left. Fit windows and other openings admitting light with dark curtains as specified under Assembly Hall. Electric lighting from the top, controlled at point convenient to demonstration table.

(3.) *Floor* stepped up in fireproof construction and finished in wood, like floor.

(4.) *Heating and Ventilation*.—As for classrooms, with extra ventilation to remove fumes. Space at left end of desk provided with register and flue of at least 10 inches diameter, to afford means of down draught. Flue carried under floor to nearest wall, flue and draught actuated by motor if not sufficient.

(5.) *Equipment*.—Demonstration table, not less than 12 feet long, not more than 3 feet nor less than 30 inches wide, height 32 inches. Placed 4 feet distant from wall, material same as that of room, top made of pine plank and finished like chemical laboratory desks. Pneumatic sink at right hand of desk, of soapstone in two depths. Not to exceed 30 inches long, 20 inches wide. Depth, 4 inches to 6 inches minimum; 16 inches to 18 inches maximum. Length of minimum depth not to exceed 60 per cent of total length. Sink to be depressed in table and provided with flush cover. Sink to have screened drain with mercury trap and overflow. Supply hot and cold water under reduced pressure and cold water under street pressure for quick filling, 2 goosenecks with $\frac{3}{4}$ -inch hose bibbs, to one of which combined blast and suction pump may be attached; steam supply direct from boiler main with a by-pass to summer boiler; supply gas air suction, and gas taps not exceeding 6 in number. Over demonstration table, secured to ceiling, provide a plank with heavy screw hooks. Behind lecture table provide sliding blackboards of not less than 50 square feet, and a canvas curtain on heavy spring roller for attaching charts. Drawers and closets for lesser lecture apparatus and chemicals in body of table, wall on either side provided with shelves for reagent bottles under glass, and side wall provided with cabinets for larger pieces of permanent apparatus, if there is no special room for this. Lifting seats with desk for taking notes arranged

on platforms, so that the successive tiers will rise one above the other to insure an unobstructed view of demonstration table. (See drawing.)

(6.) *Electricity*.— Provide three (3) forms of current, viz., one circuit for direct current at 110 volts, 30 amperes, and one circuit of 5 to 20 volts, 50 amperes, and one circuit for alternating current at 110 volts, 30 amperes. Regulating rheostat for the 5 to 20 volt direct current to be located conveniently to table. A 50-ampere ammeter and a 125-volt voltmeter, both with extra large illuminated dials, mounted on swing brackets in full view of class and instructor; suitable means for switching ammeter and voltmeter to either circuit. Terminate circuits in non-reversible push plug receptacles. A projection lantern and receptacles for same at end of table and at rear of room. Lantern screen on spring roller at side of room, width of screen usually 12 feet, but dependent on distance and lenses used.

ADMINISTRATIVE FACILITIES.

(1.) *Apparatus Store-room*.— Should give ample space for storage of extra and reserve apparatus and original packages of stock chemicals. These should be kept in dust-proof cabinets with glass doors and in drawers.

(2.) *Preparation-room*.— This should adjoin the above. Primarily for storage of liquid chemicals in bulk and preparation of liquid reagents and storage of supply bottles, also fitted for teacher's laboratory. Should have wide centre table with gas in centre, working desks, with drawers and closets along two sides, also gas, water, sink, blast, suction, steam and electricity. Shelves along desks for storage of liquid chemicals, supply bottles and smaller reagent bottles. An adequate hood should be provided.

(3.) *Office and Balance Room*.— Adjoining store-room and preparation-room should be small room to contain desk, book shelves, table and a good grade balance.

PHYSICAL LABORATORY.

(1.) *Size*.— In a space about 30 by 40 feet. A laboratory, apparatus-room and shop.

(2.) *Light*.— The same basis as for classrooms, one wall having as direct a southern exposure as possible for *porte lumiere* studies. Artificial light as in a class-room. Dark curtains in addition to regular shades for darkening room. Windows and all openings

admitting light fitted as specified under Assembly Halls (page 65).

(3.) *Heating and Ventilation*.—On same general basis as for class-rooms.

(4.) *Equipment*.—Small laboratory tables to accommodate two or four pupils at each, built of hard wood, white pine tops, fitted with 4 drawers, supports and adjustable cross-bar. Wall tables around room on sides where there are windows, with one or two shallow drawers under, but not deep enough to interfere with comfort of pupil. Soapstone drip sinks with cold water to be provided at these tables, one to every six or eight pupils. Instructor's table, fitted with hot and cold water, Richards' pump, numerous cupboards and drawers of various depths and widths. Two-inch plank bolted to ceiling over this table, with space of 2 or 3 inches between plank and ceiling for attachment of pendulums and other apparatus. Provide electric outlet for stereopticon and screen for same.

(5.) *Furniture*.—Provide adjustable stools for all the tables and a sufficient number of tablet arm chairs to accommodate the entire division during demonstration exercises. Chairs to be placed in rectangle formed by pupils' tables and demonstration table. These are not in building contract, but to be laid out on preliminary plans.

(6.) *Electricity*.—One outlet for direct current at 110 volts E. M. F. and 30-ampere capacity. One outlet for direct current at low voltage with regulator conveniently located. One outlet for alternating current at 110 volts E. M. F. and 30-ampere capacity. One outlet for each kind of current at demonstration table, to be single pole push plugs instead of binding posts. Series and multiple connections at each pupil's table. Switch in laboratory to cut out pupils' tables.

(7.) *Gas*.—Pupils' tables to be equipped with gas, 4 cocks to each table. Wall tables to be equipped with gas. Demonstration table to be provided with gas.

(8.) *Bulletin Board*.—25 to 50 square feet of bulletin board, covered with burlap, secured at edges, but not glued on like wall paper.

(9.) *Blackboards*.—As much blackboard space as possible. Sliding blackboards back of demonstration tables.

APPARATUS
ROOMS.

(1.) *Size*.—One large or several small rooms, to open directly out of laboratory, and connected with lecture-room.

(2.) *Equipment*.—To be fitted with dust-tight cases with adjustable shelves and sliding glass doors, 7 feet high; cabinets of drawers of various widths and depths, mostly narrow and shallow. Some of these cases may be in the laboratory if there is sufficient wall space. A small sink and hood should be provided.

SHOP.

A small shop is desirable, though not absolutely necessary. This should be equipped with work bench, power lathe, belted to motor generator, and shelving for tools and stock, and may be set up in apparatus-room.

BOTANICAL AND
ZOOLOGICAL
LABORATORY.

(1.) *Size*.—In a space about 30 by 40 feet. Laboratory and apparatus-room.

(2.) *Light*.—Windows the same as for class-rooms, one wall with southern exposure. Artificial light as in class-rooms.

(3.) *Equipment*.—(a.) Twenty-one pupils' tables, 54 inches by 24 inches by 30 inches high, each to accommodate two pupils, to have plate glass tops.

(b.) Soapstone sink, 72 inches by 30 inches, 10 inches deep, accessible on all sides. Supply with cold water, about 8 bibbs and 2 hose bibb cocks.

(c.) One aquarium, 30 inches long, 20 inches wide and 20 inches high, with supply, gooseneck cock with aspirator and standing waste.

(d.) Ice chest, 36 inches by 24 inches.

(e.) Cases built wherever practicable. Three sections to contain 42 pigeonholes, 3 inches by 3 inches by 8 inches, for storage of instruments. A liberal supply of cases to contain drawers and cupboards in lower compartment, and shelves above, for exhibition of specimens, storage of material, instruments, books, charts, etc.

(4.) *Furniture*.—Forty-two adjustable screw revolving chairs, not in building contract.

GYMNASIUM
AND DRILL
HALL.

(1.) To be used in common for gymnasium exercises, athletic games and the drilling of the school cadets. On account of its size and for structural conditions to be generally located in the basement, with clear span of ceiling and combined height of basement and

first story. Visitors' gallery generally provided at one end, entered from first floor.

(2.) *Size*.—The classes exercising in the gymnasium are from fifty to one hundred, and a suitable floor space for this number, as well as floor space for a full company of cadets at drill, is from 3,750 to 4,000 square feet. The height should not be less than 24 feet.

(3.) *Light*.—Ample outside light in all cases. Electric light from ceiling protected with wire guards.

(4.) *Heat and Ventilation*.—The former sufficient to guarantee a temperature of about 60 degrees, and about twice as much ventilation as is customary for the ordinary classroom. This is, of course, insufficient for the number of people who might occasionally occupy the gymnasium for exhibitions, but it is more than enough for the ordinary number using it for class exercises.

(5.) *Equipment*.—The standard gymnastic apparatus consists of the following fixtures, which may be slightly modified in particular cases:

- 25 Bar stalls.
- 25 Bar stall benches.
- 2 Double booms.
- 2 Saddles.
- 20 Vertical ropes.
- 2 Serpentine ladders.
- 2 Boxes, 1 horse.
- 12 Balance boards.
- 2 4 by 7 mats.
- 2 5 by 10 mats.
- 4 Pairs jumping standards and ropes.
- 2 Pairs basket ball goals.
- 3 Basket balls.
- 4 2½-lb. medicine balls.
- 16 2-lb. medicine balls.
- 4 Indoor baseballs and bats.
- 1 Fairbanks scale.
- 1 Water spirometer.
- 1 Tape measure.
- 1 Dozen glass mouthpieces.
- 24 Bean bags.
- 1 Truck to carry mats.
- 100 Pairs ¾-lb. Indian clubs.
- 2 Jump boards.
- 1 Shoulder caliper.
- 100 Solid rubber bounding balls, 2¼ in. diameter.
- 100 Pairs ¾-lb. dumb-bells.
- 100 Wands ¼-in. in diameter.

(6.) *Gun Racks*.—Racks for holding the guns

carried by the cadets should be provided on walls. These racks should be protected by locked doors.

(7.) *Special Rooms.*—Adjoining gymnasium and drill hall two small rooms about 10 feet square should be provided for school matron and director of gymnasium.

(8.) *Dressing-rooms, Baths and Lockers.*—
(a.) *System.*—The clothing of all the pupils is in a central locker-room, each suit being numbered, and all being under the control of the attendant in charge. Dressing-rooms are provided in number equivalent to the number of a class. A class coming for exercise are given their gymnasium clothing and keys to dressing-rooms, which they lock behind them when exercising. After exercise they can take a shower bath. When dressed the dressing-room keys are given up, but the gymnasium clothing is left to be gathered up by the attendant. The clothing is carried to the dry-room, and when dried each set is put back in its proper pigeonhole.

(b.) *Lockers.*—The locker-room is controlled by the attendant, and contains pigeonholes, 10-inch cube, one for each pupil in the school, and a counter over which to deliver the clothing. Adjoining this is the dry-room, capable of being heated to a high temperature and thoroughly ventilated. This is fitted with hooks and clothesline.

(c.) *Dressing-rooms.*—The dressing-rooms are small cabins, about 3 feet square, with a locked door, a seat and hooks.

(d.) *Showers.*—The shower baths are 3 feet square, divided by slate partitions, similar to those for water-closets, each having a bar at the front, over which a cotton sheet can be dropped. Each compartment has two sprays in opposite corners.

Rooms shall be provided for drawing, and in boys' schools for shop work in addition.

(1.) *Size.*—The space for each subject should be about 1,500 to 1,800 square feet.

(2.) *Light.*—Windows and artificial light by special fixtures. North light preferable in the drawing-rooms.

(3.) *Floors.*—Of wood.

(4.) *Walls.*—As in a manual training room.

(5.) *Ceilings.*—As in a manual training room.

(6.) *Heating and Ventilation*.—Same as in manual training rooms.

(7.) *Stock-room*.—The lumber stock-room should contain at least 80 square feet, and preferably be long and narrow. Shelves as directed.

(8.) *Teachers' Closets*.—As in manual training room.

(9.) *Fittings*.—(a.) Bookcases, like those in class-rooms, 150 capacity.

(b.) *Cases*.—For work in process, extra tools, supplies, drawing boards, models, paper, finished drawings, etc. (For all of these get directions and see former High School drawings.)

(c.) *Display Frames*.—Size and position as directed, to be of burlap over soft wood back with 2-inch moulding around.

(d.) *Sink*.—A 5-foot sink, with hot and cold water, fountains as directed.

(10.) *Equipment of Free-hand Drawing-room*.—Provide at least 25 oak drawing tables of approved type to be used by boys and girls in common.

(11.) *Equipment for Mechanical Drawing-room*.—(For boys only.) See Appendix XII. and former High School drawings.

(12.) *Equipment of Woodworking Rooms*.—(For boys only.) Provide at least 20 cabinet benches of approved type with quick action, iron vises. Provide glue pot with electric or gas connections as directed. Machinery if directed.

(13.) *Equipment of Metal-working Room*.—(For boys only.) Six double benches 8 feet by 2 feet, fitted with 12 Prentiss iron vises, 3½-inch jaw; wall bench fitted with 10 stations, tool drawers and 5 Bower's tool holders; one ¼-inch gas hose cock terminal above each bench station; 2 gas blast burners, 1 large, 1 small; metal-covered bench with ventilated hood; 1 muffle furnace, ventilated; 1 drill; 1 grindstone; 1 pair bench shears. Machinery if directed.

(14.) *Motor*.—If directed.

(15.) *Blackboards*.—For each class-room for above subjects provide about 15 running feet of slate blackboard 4 feet high.

HOUSEHOLD SCIENCE.

(1.) *Size*.—The space should be about 1,200 square feet, and should accommodate the kitchen, two small rooms for showing the care of a dining-room and of a bedroom, and a china closet and pantry.

(2.) *Light, Heat, etc.*—The same as that for other rooms, with additional ventilation in the kitchen.

(3.) *Equipment.*—The kitchen to contain an equipment as may be decided upon by the Board after consultation; a kitchen pantry fitted with shelving and a china closet fitted with a sink; drawers, cupboards and shelves enclosed with glass doors. The dining-room and bedroom simply finished rooms, having no equipment except the furniture.

LUNCH-ROOMS.

(1.) *In General.*—The lunch-rooms in Boston schools have usually been located in the basement, and where these are high and well lighted this location seems to serve satisfactorily. They should, however, have the special ventilation that is provided in a basement cooking-room. In size they should accommodate comfortably, seated at benches or small tables, that proportion of the pupils in the school which takes advantage of the luncheon facilities.

(2.) *Equipment.*—(a.) The counter should be set at height as required, and should have a rail 2 feet from it, with openings at intervals, to keep children in single file, and there should be accommodation under the counter for dishes.

(b.) *Range.*—A six-hole gas range, with ample oven space.

(c.) *Sinks.*—Two good-sized soapstone sinks.

(d.) *Ice-box.*—Of sufficient size to take care of milk supply.

(e.) *Lockers.*—Sufficient to care for the clothing of the attendants, and for mops and brooms, etc. These should not be under the counter or near any place where food is kept.

(f.) *Furniture.*—In some cases the children are provided with camp chairs and small round tables to seat four. In others ordinary school benches have been provided. Both seem fairly satisfactory in operation.

LIBRARY.

A space equivalent to a small class-room is ample for library purposes. The book accommodation will depend somewhat on the size of the school. The library is planned as a reading-room, that is, with the books in the room and not in a separate stack-room.

WARDROBES.

(1.) In high schools common wardrobes are — one for boys and one for girls — advised for all the clothing, situated on the lower floor to

avoid bringing dirt into the upper floors. There being an attendant on the lower floor, the room, as a whole, can be locked up.

(2.) *Light*.—The rooms should have outside light.

(3.) *Heat and Ventilation*.—This should be thoroughly well heated and ventilated similar to class-rooms.

(4.) *Equipment*.—The poles, hooks, etc., will be similar to those used in other schools, but more space should be given the girls, *i. e.*, about 1 foot 6 inches on centre. It has been found desirable to have some locked pigeon-holes, 20 by 20 by 12 inches.

ELECTRIC
WORK.

(1.) *Service*.—This should enter basement underground at location to be determined by reference to street mains, and should terminate on a switchboard located in a fireproof closet, opening if possible into the basement corridor.

(2.) *Conduits*.—All wires to be run in iron conduit concealed, except conduits for mains in basement, and side outlets in boiler, engine and stack rooms. Tap circuit conduits to be run above rough floor wherever possible. If floor construction will not allow this, they are to be run below floor beams and above ceiling, a space of 2 inches being left in which they can be run.

(3.) *Wire Slot*.—Obtain from electrical division the location of slots and openings for conduits and panel boards.

(4.) *Cabinets*.—All cabinets to be furnished by wiring contractor, but finished by the general contractor.

(5.) *Cutting*.—All cutting and patching to be done by the general contractor.

(6.) *Outlets*.—Class-rooms to be provided with nine four-light ceiling outlets, controlled by three switches. Wardrobes to have one ceiling outlet, controlled by switch in class-room. Corridors to be lighted from ceiling wherever possible. Height of side outlets in rooms and corridors to be 6 feet 6 inches. Switch outlets in class-rooms to be 6 feet, elsewhere 4 feet. Switches in corridors, play-rooms and pupils' toilet-rooms to be operated by private key. In lower elementary schools omit all electric lighting in class-rooms. Basement and corridor lighting to be installed as directed by the Board.

(7.) *Fixtures*.— Fixtures in class-rooms to be of special design to combine a direct and diffused light.

(8.) *Gas*.— Gas outlets to be provided in all corridors, vestibules, stairways, boiler-room and assembly hall exits; all to be wall outlets. Gas-piping to be included in the electrical engineer's work.

(9.) *Stereopticon*.— All grammar schools and high schools to be provided with an electric projection lantern with reflectoscope attachment.

(10.) *Clocks and Bells*.— All schools to be provided with an electric system of clocks, operated by a master clock. All primary schools to be provided with a system of signal bells, operated by push buttons. In all grammar and high schools the bell system to be operated automatically by master clocks, according to prearranged program.

(11.) *Telephones*.— In all schools, each class-room, hall, teachers' room and boiler-room to be connected to master's office, or to room occupied by the first assistant, by a telephone system.

In lower elementary schools omit class-room telephones except in first assistant's room, boiler-room and one corridor.

NOTE.— Drawings showing special fittings for both plumbing and interior fittings will be found in Appendices XII., XIII. and XIV.

APPENDIX VIII.

I.

NEW BUILDINGS — BOND ISSUE.

LIST OF 1912-1913.

Item 3. — Public Latin Annex and Supply Building.

This annex is being built on land owned by the city situated on Dartmouth street and Warren avenue, and will be an integral part of the present school. The area of the annex is 5,643 square feet.

The basement is given to the Supply Department and will contain three supply-rooms fitted up with bins, etc., toilets, an elevator, a garage for the department automobiles and a loading platform. Part of the basement of the present building is to be altered, a portion being taken for the Supply Department and increased space being given to the boiler, toilet and lunch rooms. The present coal bunkers are to be given up to these uses, and a new one is to be built adjoining the boiler-room. The yard is to be repaired and made capable of bearing the heavy coal teams and Supply Department motors.

The first floor is also given to the Supply Department and will contain two large supply rooms, fitted up with cases, counters, etc., offices and toilets, and an elevator to the basement.

The second floor will contain a workshop, physical laboratory with apparatus room, lecture and apparatus rooms, supply-room and a room for book storage divided into two stories.

The third story contains two large study-rooms. Both the second and third stories are connected directly with the corridors of the existing building.

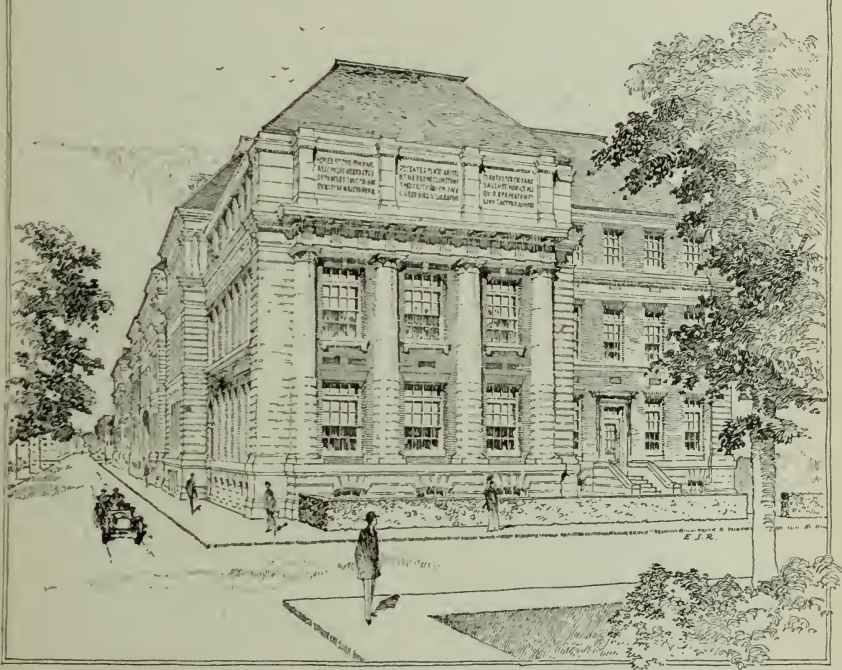
The interior construction is second class, except that the floor timbers are carried on steel beams. The exterior matches the present building, but cast stone is used instead of limestone.

Electric System.— The annex is wired and equipped for electric lighting, clocks and automatic program system, inter-communication telephones, local and auxiliary fire-alarm systems and laboratory apparatus.

Heating and Ventilating System.— The building is warmed and ventilated by a low pressure, gravity return direct indirect system, steam being obtained from the present boiler plant.

The laboratories, study-rooms, lecture-rooms, etc., are warmed and ventilated by direct indirect box-base radiators, the fresh air entering through openings in the wall directly behind each radiator. The temperature of the rooms is under

ADDITION TO THE PUBLIC LATIN SCHOOL
WITH SUPPLY DEPARTMENT FOR THE PUBLIC SCHOOLS.
WARREN AVENUE & DARTMOUTH STREET BOSTON.
COOLIDGE & CARLSON ARCHITECTS.



the control of the teachers by manipulation of the valves, which are placed on each radiator. All other rooms in the building are warmed by direct radiation.

All vent flues throughout the building are constructed of masonry. In all vent flues the movement of foul air is stimulated by means of aspirating coils placed in the flues.

Item 4.—Brighton High Addition. This addition is being built on land adjoining the Brighton High School on Cambridge and Warren streets, Brighton, containing 29,548 square feet, making the total area of the high school lot 71,419 square feet. The addition covers an area of 8,005 square feet. It is directly connected with the main building on all stories by wide corridors.

The basement contains a gymnasium, drill, shower bath and fan room.

A mezzanine story contains the upper part of the gymnasium, lunch-room and office for the physical director, the women instructors and a hot water heater room for the shower baths.

The first story contains the assembly hall and one class-room, 30 feet by 39 feet.

The second floor contains the upper part of the assembly hall, the balcony and one class-room 30 feet by 39 feet.

The third story contains one class-room, 30 feet by 39 feet, a work-room and a storage-room. The construction is second class and the finish both interior and exterior corresponds with that of the present building.

Electric System.—The addition is wired and equipped for electric lighting, clocks and automatic program system, intercommunicating telephones, local and auxiliary fire-alarm system and laboratory apparatus.

Heating and Ventilating System.—The building contains a plenum system of ventilation.

The present plant has been rearranged, a new boiler set beside the two old ones and an electric pump has been installed to return the water of condensation from the addition to the boiler plant.

A three-quarter housing steel plate fan, belt connected to a variable speed electric motor, furnishes air for ventilation. The ducts are so arranged that air may either be supplied to the assembly hall and gymnasium or to the class-rooms.

The building is warmed by direct radiation placed under the windows, that in the class-rooms and assembly hall being of the wall type. The temperature of the class-rooms, gymnasium and assembly hall is controlled by means of thermostats which operate stop valves placed in the piping to radiators.

All heat and vent ducts are constructed of galvanized iron. Aspirating coils are placed in the vents from the assembly hall and gymnasium to stimulate the movement of foul air in the flues. The moving picture booth is ventilated by means of an exhaust fan of the multi-blade type directly connected to an electric motor.

An instantaneous hot water generator is installed to furnish hot water to the showers.

Item 5.—Marshall Addition. This addition is being built on a lot situated next to the Marshall School containing 18,224 square feet. The total area of the school lot is now 48,594 square feet. The addition covers 10,829 square feet.

There is no basement, the first floor being four feet lower than that of the present school, and connected with it by steps. This story contains the assembly hall, 60 feet by 42 feet, two class-rooms, 32 feet by 21 feet, with wardrobes, manual training room, 42 feet by 20 feet, and a fan-room. The assembly hall has a separate entrance for the public from the street, and one from the school. A new cooking room for the district is also to be installed in one of the play-rooms on this floor in the existing building.

The second story, which is directly connected with the main school, will contain three class-rooms, 32 feet by 21 feet, with wardrobes, book, reception and master's rooms. A new teachers' room with toilet is being made, the old one being turned into a nurse's room.

The construction is second class and the addition matches the old building in material and finish.

Electric System.—The addition is wired and equipped for electric lighting, clocks and automatic program bells, intercommunicating telephones and a combined local and auxiliary fire-alarm system. It is also equipped with a vacuum cleaning system.

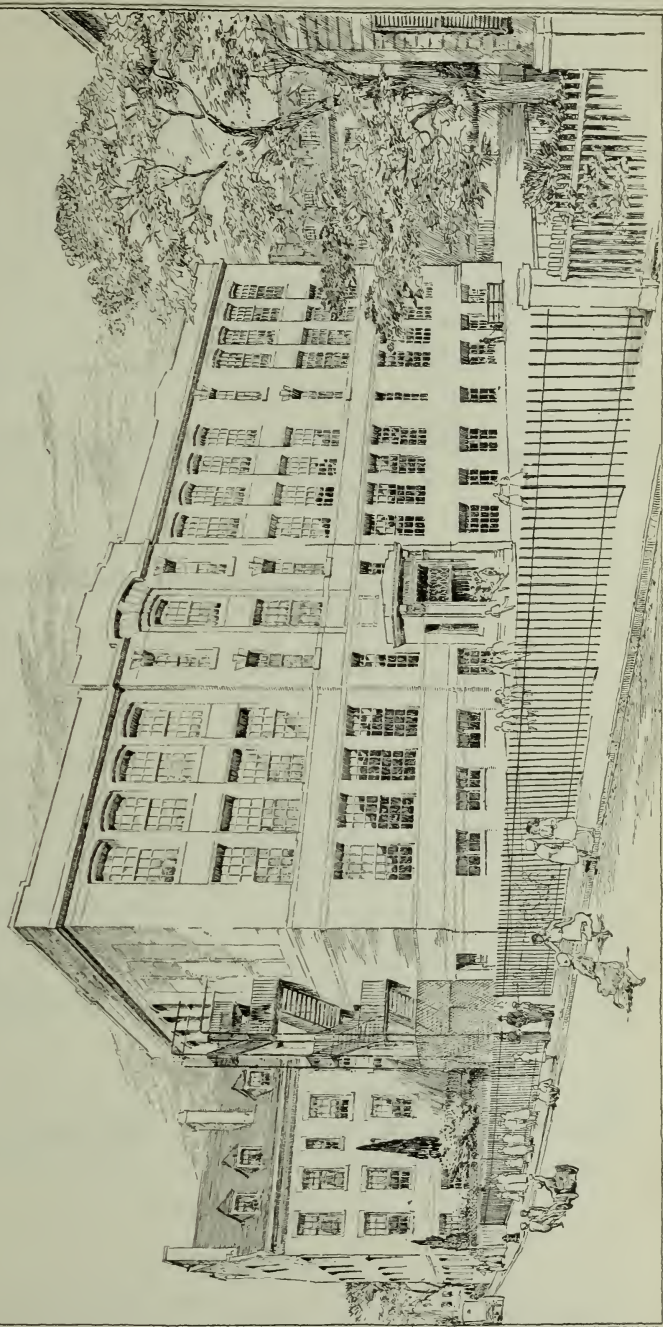
Heating and Ventilating System.—The building contains a plenum system of ventilation. Steam is obtained from the boiler plant in the present building, the water of condensation being returned to the boilers by means of electrically driven pump located in a pit in the addition.

A full-housing, steel plate fan, belt driven by a variable speed electric motor, furnishes air for ventilation. The fresh air ducts are so arranged that air may be supplied either to the assembly hall or to the class-rooms. The air is heated by a primary stack of indirect radiators, the temperature being maintained at 68 degrees Fahrenheit by mixing dampers controlled automatically by a thermostat with graduated action located in the warm air duct.

The building is warmed by direct radiators. Those in the class-rooms are the wall pattern placed under the windows, those in the assembly hall, corridors and other rooms generally are of the column type. The temperature in the class-rooms, assembly hall and manual training room is automatically controlled by means of thermostats which operate diaphragm valves placed in the piping to radiators.

Item 6. Oliver W. Holmes District Elementary School. The lot on which this school is to be built is situated on Park street, Dorchester, in the Oliver W. Holmes District. The area of the lot is 59,707 square feet and that of the building is 6,636

~ FRANKLIN - DISTRICT - SCHOOL - GROTON - ST - BOSTON - MASS ~
~ ANDREW'S - JACQUES - AND RANTOUL - ARCHITECTS ~
BOSTON - MASS ~

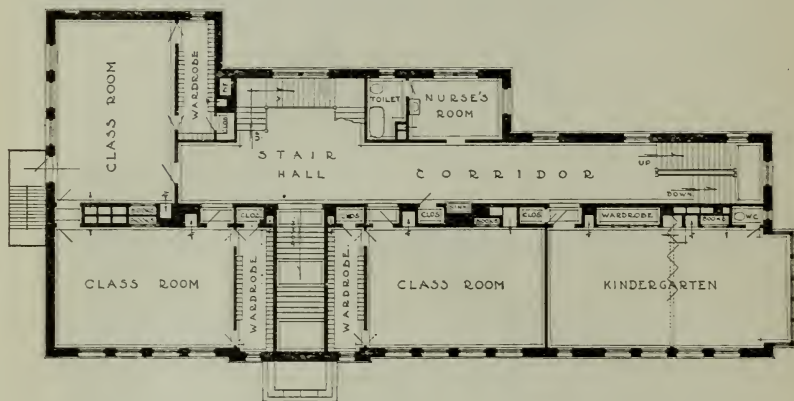


CITY OF BOSTON

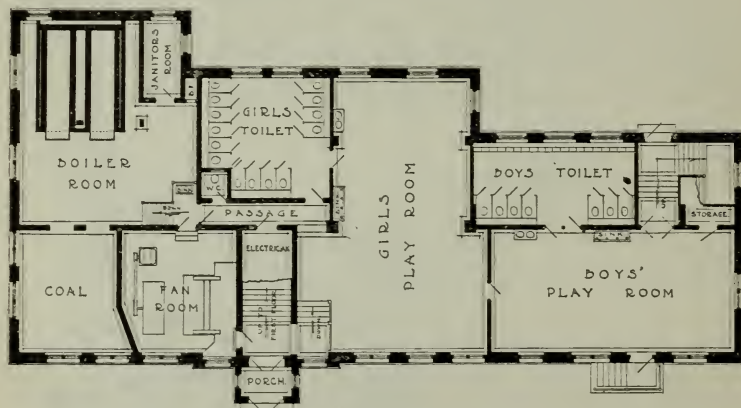
LOWER ELEMENTARY SCHOOL

FRANKLIN DISTRICT - GROTON STREET

ANDREWS, JACQUES AND RANTOUL ARCHITECTS



FIRST FLOOR PLAN



BASEMENT PLAN

SCALE

0 5 10 15 20

square feet. The basement contains the coal and boiler rooms, janitor's and electrician's closet, storage and fan rooms and boys' and girls' toilets and play rooms.

The first floor contains four class-rooms, 28 feet by 20 feet, with wardrobes, kindergarten, 43 feet by 20 feet, with toilet, nurse's and teachers' rooms, with toilets.

The second floor contains five class-rooms, 28 feet by 20 feet, with wardrobes, book room, and an emergency toilet.

The construction is second class. The exterior is new brick with cast stone trimmings.

Electric System.—Wired and equipped for electric light, clocks, bells, outer-communication telephones and a combined local auxiliary fire alarm system.

Heating and Ventilating System.—The building contains a plenum system of ventilation. Steam is obtained from two horizontal return tubular boilers located in the basement, the water of condensation returning by gravity.

A full-housing steel-plate fan, belt driven by an electric motor, supplies air for ventilation. The air is heated by a primary stack of indirect radiators, the temperature being maintained at 68 degrees Fahrenheit by means of mixing dampers automatically controlled by a thermostat, with graduated action, located in the warm air duct.

The building is warmed by direct radiators located under the windows, those in the class-rooms being of the wall type. The temperature of the class-rooms and kindergarten is controlled by means of thermostats which operate diaphragm valves placed in the piping to radiators.

All water-closets in basement toilet rooms have outlets for seat ventilation which are connected together by means of galvanized-iron ducts and run in separate flues to the top of building. Connection is also made to the space back of the urinal. All individual closets have similar seat vents.

All heat and vent ducts are constructed of galvanized iron. In all vent ducts except those from class-rooms and kindergarten the movement of foul air is stimulated by means of aspirating coils placed in the flues.

II.

NEW BUILDINGS—TAX LEVY APPROPRIATION.

LIST OF 1912-1913.

Item 1.—Franklin District. A new building is being erected on the site of the old Cook School in the Franklin District, which contains an area of 10,170 square feet, and 8,569 square feet additional were bought, making a total of 18,739

square feet. The area of the building is 5,653 square feet. The building is so planned that the school rooms all face on the open side towards the yard, giving plenty of light and air, even in that congested district.

The main entrance is on the yard side, with two basement entrances also into the yard.

The basement contains boiler, coal and fan rooms, electrician's closet, janitor's room, boys' and girls' toilets and play rooms.

The first floor contains three class-rooms, 30 feet by 20 feet each, wardrobe to each room, fitted with separate galvanized-iron compartments, one for each pupil; nurse's room and toilet; kindergarten, 41 feet by 20 feet, with toilet.

The second floor contains four class-rooms, 30 feet by 20 feet, teacher's room and toilet, two emergency closets.

Third floor four 30 feet by 20 feet class-rooms and one unassigned room.

The exterior of the building is of red brick with artificial stone trimmings and a flat roof. The construction is second class, with a fireproof floor over the entire area of boiler and coal rooms.

Electric System.—Wired and equipped for electric light, clocks, bells, outer-communication telephones and a combined local auxiliary fire alarm system.

Heating and Ventilating.—The building contains a plenum system of ventilation; steam is obtained from two horizontal return tubular boilers located in the basement, the water of condensation being returned by gravity.

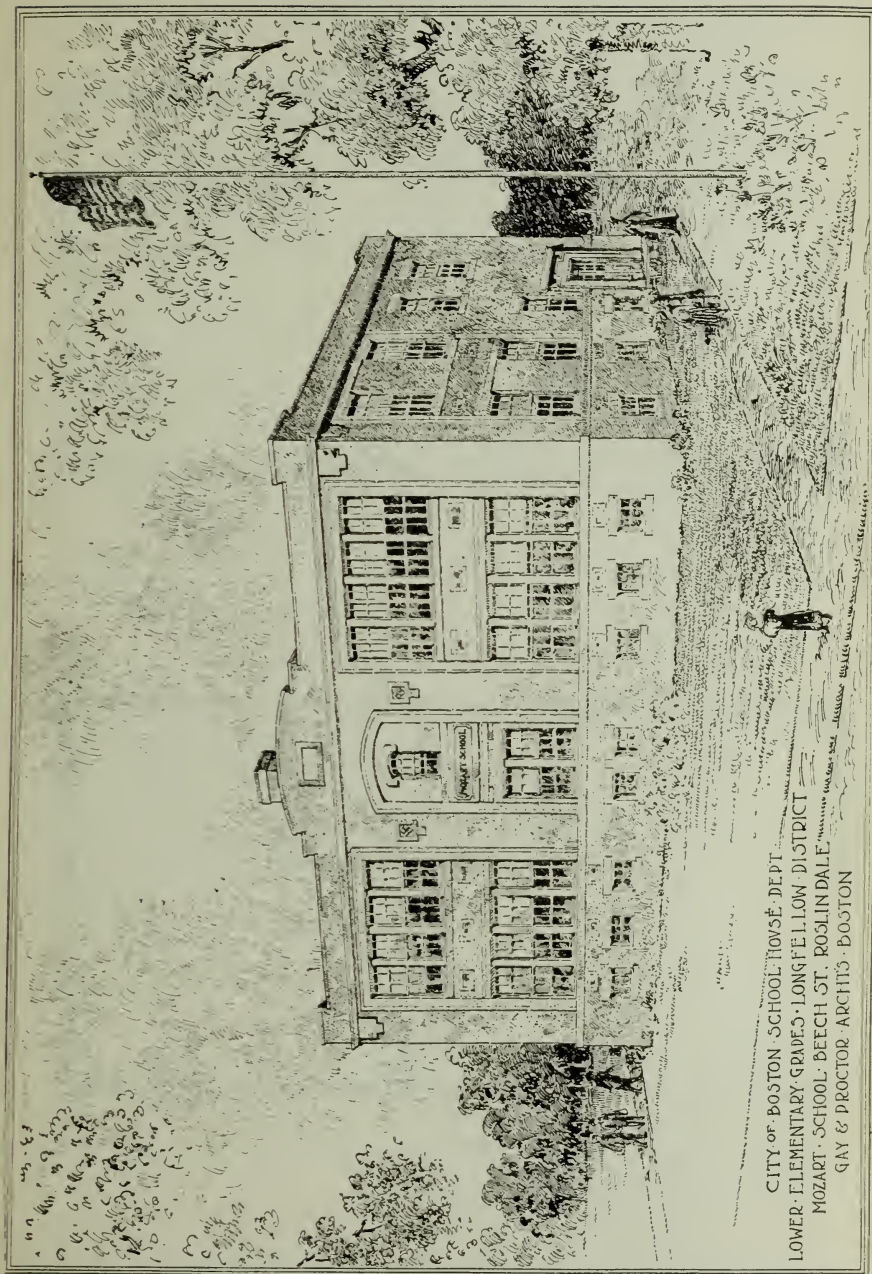
A full-housing steel-plate fan, belt driven by an electric motor, furnishes air for ventilation. The air is heated by a primary stack of indirect radiation, the temperature being maintained at 68 degrees Fahrenheit by means of mixing dampers automatically controlled by a thermostat with graduated action located in the warm-air duct.

The building is warmed by direct radiators located under the windows, those in the class-rooms being of the wall type. The temperature of the class-rooms and kindergarten is controlled by means of thermostats which operate diaphragm valves placed in the piping to radiators.

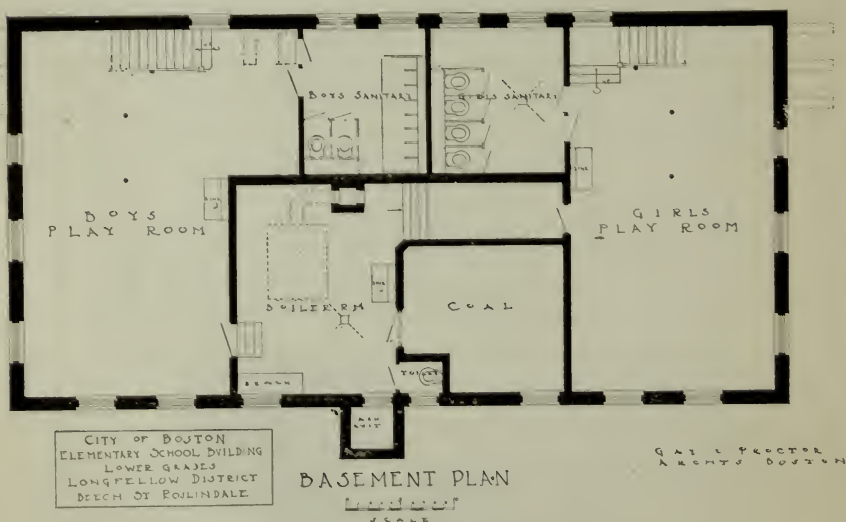
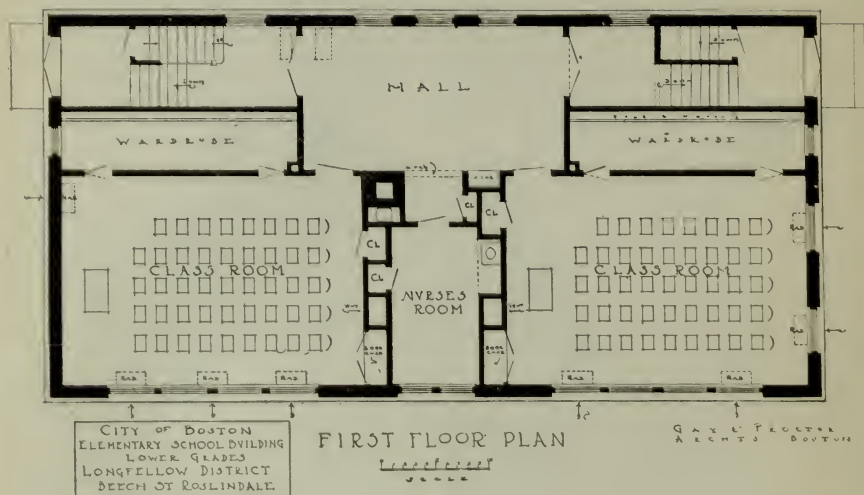
All water-closets in basement toilet rooms have outlets for seat ventilation which are connected together by means of galvanized-iron ducts and run in a separate flue to the top of the building. Connection is also made to the space back of urinal. All individual closets have similar seat vents. An electric propeller fan is placed in the main toilet vent to exhaust the air.

All heat and vent ducts are built of galvanized iron. In all vent ducts except those from class-rooms and toilet rooms the movement of foul air is stimulated by means of aspirating coils placed in the ducts.

Item 5.—Charles Sumner District. This school is being built on a lot containing 19,200 square feet, situated between



CITY OF BOSTON SCHOOL HOUSE, DEPT.
 LOWER ELEMENTARY GRADES - LONGFELLOW DISTRICT
 MOZART SCHOOL - BEECH ST. ROSLINDALE
 GAY & PROCTOR ARCHT'S - BOSTON





BOSTON SCHOOLHOUSE DEPT. ELEMENTARY SCHOOL CHARLES SUMNER DIST.

ELEMENTARY SCHOOL
CHARLES SUMNER DISTRICT
CITY OF BOSTON
SCHOOLHOUSE DEPT
1913

CITY OF BOSTON
SCHOOLHOUSE DEPT
1913



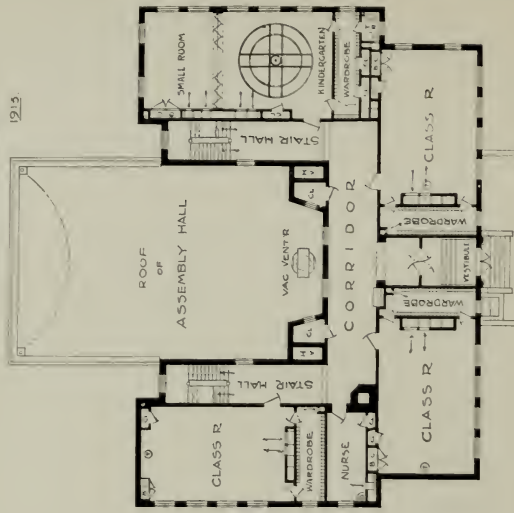
PLAN OF BASEMENT

FOLSOM

ST

ELEMENTARY SCHOOL
CHARLES SUMNER DISTRICT
CITY OF BOSTON
SCHOOLHOUSE DEPT
1913

CITY OF BOSTON
SCHOOLHOUSE DEPT
1913



PLAN OF FIRST FLOOR

Folsom and Jewett streets, Mt. Hope, with a frontage of 120 feet on each street. The building itself has an area of 8,473 square feet, and contains an assembly hall and eight class-rooms.

The basement contains the assembly hall, with entrance on the rear at grade for the public; the boiler and coal rooms, electrician's and janitor's rooms, boys' and girls' toilets and play rooms.

The first story contains the upper part of the hall, three class-rooms 30 feet by 20 feet with wardrobes and a kindergarten 20 feet by 39 feet with wardrobe.

The second story has four class-rooms 30 feet by 20 feet, with wardrobes, nurse's and teachers' rooms, two emergency toilets and a storeroom.

The construction is second class, with a fireproof floor over the boiler and coal rooms. The exterior is of red brick with cast stone trimmings.

Electric System.—The building is wired and equipped for electric lighting, clock and automatic program system, intercommunicating telephones and a combined local and auxiliary fire alarm system.

Heating and Ventilating.—The building contains a plenum system of ventilation. Steam is obtained from two horizontal return tubular boilers located in the basement, the water of condensation being returned by gravity.

A three-quarter housing, steel-plate fan, belt driven by an electric motor, furnishes air for ventilation. The air is heated by a primary stack of indirect radiators, the temperature being maintained at 68 degrees Fahrenheit by means of mixing dampers controlled automatically by a thermostat with graduated action, located in the warm-air duct.

The building is warmed by direct radiators located under the windows, those in the class-rooms being of the wall type. The temperature of the class-rooms, kindergarten and assembly hall is controlled by means of thermostats which operate stop valves placed in the piping to radiators.

All water-closets in the basement toilet rooms have outlets for seat ventilation which are connected together by means of galvanized-iron ducts and run in separate flues to the tops of main ventilators. Connection is also made to the space back of urinal. All individual closets have similar seat vents.

All heat and vent ducts are constructed of galvanized iron. In all vent ducts except those from class-rooms the movement of foul air is stimulated by means of aspirating coils placed in the ducts.

Item 6.—Mozart School. This school is situated on Beech street, Eastbourne street and Hobson street, in the Longfellow District. The lot contains 29,932 square feet, and the area of the building is 2,628 square feet.

The basement contains boiler, coal, janitor's and electrician's rooms, toilets and play-rooms for boys and girls.

The first story has two class-rooms 28 feet by 20 feet 5 inches, with wardrobes and a nurse's room.

The second story the same number of class-rooms with teachers' and store rooms and an emergency closet.

The construction is a departure from that generally used by the Schoolhouse Commission in that the outer walls are built of 12-inch hollow terra cotta blocks. The outside is finished with cement plaster and slapdash, and the inner surfaces are plastered directly on the terra cotta. The balance of the work is second-class construction, with a fireproof floor over coal and boiler rooms.

Electric System.—The building is piped for the installation of electric lighting apparatus and is equipped with a system of program bells.

Heating and Ventilating.—The building is warmed and ventilated by a low pressure steam, gravity return, direct indirect system, steam being obtained from a cast-iron sectional boiler located in the basement.

The class-rooms are warmed and ventilated by direct indirect box-base radiators located under the windows, fresh air entering through openings in the wall directly behind each radiator. The temperature of the rooms is under the control of the teachers by manipulating the valves which are placed on each radiator. All other rooms in the building are warmed by direct radiation.

All vent flues throughout the building are constructed of galvanized iron. All water-closets in the basement toilet rooms have outlets for seat ventilation which are connected together by means of galvanized iron and run in separate flues to the tops of the main ventilators. Connection is also made to the space back of the urinal. Aspirating coils are placed in all vent ducts to stimulate the flow of foul air.

Item 10.—Andrews School Addition. The addition consists of two wings, one on each end of the present building, each containing three rooms. The present lot contained 12,578 square feet and 1,781 square feet more were bought on the east end to enlarge the yard. Complete new heating and sanitary systems are being installed.

The area of the original building was 4,568 square feet, and the two new wings will cover 1,921 square feet, making a total area of 6,489 square feet for the completed building. A new coal pocket outside the building has an area of 679 square feet.

At present the east wing is under construction, but it is hoped to have both wings completed before the opening of the school in September. The basement contains the new boiler room, boys' and girls' sanitariums, electrician's closet and janitor's room.

The east wing will have one class-room 30 feet by 22 feet and a wardrobe on each of the three floors, and the west wing the

same, the class-rooms being 25 feet 6 inches by 25 feet, the present building remaining unchanged, except in the basement.

The construction is second class, with a fireproof floor over the boiler room. The exterior is of red brick, matching the present building, as over the interior finish.

Electric System.— The addition is fitted for future installation of electric lighting and is equipped with program bells.

Heating and Ventilating.— The building contains a low pressure steam gravity return, gravity indirect system of heating and ventilating.

A new chimney has been built, the old boilers removed and two new horizontal return tubular boilers are placed in one of the new wings and connected up to the old system.

The new class-rooms are warmed by indirect pin radiation placed in heating chambers in the basement. The temperature of the air entering these rooms is controlled by hand mixing dampers operated by the teachers. All other rooms are warmed by direct radiation. The warm air and vent flues are built of No. 24 galvanized iron.

All water-closets in the basement toilet rooms have outlets for seat ventilation which are connected together by means of galvanized-iron ducts and connected to a propeller fan, the discharge from which is carried to a vent shaft in the old building. Connection is also made to the space back of the urinal.

In all vent ducts the movement of foul air is stimulated by aspirating coils placed in the flues.

Item 12.— Mary Lyon District. This building is built on a lot situated on Walk Hill street in the Mary Lyon District. The lot contains 29,731 square feet. The area of the building is 4,255 square feet.

The basement contains boiler, coal, electrician's and janitor's rooms, and toilets and play rooms for boys and girls.

The upper floor contains four class-rooms 30 feet by 20 feet, with wardrobe, nurse's and teachers' rooms.

The construction is the same as that of the Mozart School, the exterior walls being of hollow terra cotta blocks, plastered directly both inside and out on the terra cotta. The remainder of the construction is second class with a fireproof floor over the coal and boiler rooms.

Electric System.— The building is piped for future installation of electric light apparatus and is equipped with a system of program bells.

Heating and Ventilating.— The building is warmed and ventilated by a low pressure steam gravity return, direct indirect system, steam being obtained from a cast-iron sectional boiler located in the basement.

The class-rooms are warmed and ventilated by direct indirect box-base radiators located under the windows, fresh air being obtained through openings in the wall directly behind the radiators. The temperature of the rooms is under the control

of the teachers by manipulation of the valves which are placed on each radiator. All other rooms in the building are warmed by direct radiation.

All vent flues throughout the building are built of galvanized iron. All water-closets in the basement toilet rooms have outlets for seat ventilation, which are connected together by means of galvanized-iron ducts, and run in separate flues to the top of the main ventilators. Connection is also made to the space back of the urinal. Aspirating coils are placed in all vent ducts to stimulate the flow of foul air.

APPENDIX IX.

REPORT OF ARCHITECTURAL DIVISION FOR YEAR
FEBRUARY 1, 1912, TO FEBRUARY 1, 1913.

WORK EXECUTED.

Major Items.— This includes masters' offices at the Quincy and Elihu Greenwood Schools, alterations and additions to the Germantown School, Household Science Room, Dorchester High School, Administration Office and passage at the Warren School, furniture, such as benches, etc., for the Boston Industrial School for Boys, total

School for Boys, total	\$31,414
Fire escapes, 6 items	9,786
Fireproofing, 20 items	5,060
Sanitation, 8 items	3,700
Manual training rooms and furniture, 6 items	4,161
Cooking rooms, 3 items	3,070
Miscellaneous items	16,748
Total	<u>\$73,940</u>

Work for which drawings were made and in some cases specified, but not executed, amounting to approximately \$60,000

The division consists of three draughtsmen at present, also one man who has been assigned to special work on specifications and sometimes acts as Clerk of the Works. The greater part of the work requires that measurements should be taken at the building. In addition to the above, seating plans were made for twelve schools and other miscellaneous items of office work.

Respectfully submitted,

Architect.

APPENDIX X.

EXPERIMENTS ON HUMIDIFYING AIR AT THE
OLIVER WENDELL HOLMES SCHOOL.

It is only within very recent times that any serious attention has been paid either by physicians or by heating and ventilating engineers to the effect which the relative humidity has upon the comfort and health of people who by force of circumstances are compelled to daily gather together in large numbers in such places as factories, mills, schools, colleges and the like. Very little direct evidence has ever been published either, to prove or disprove the value of humidification, and those who have spoken in favor of it have argued from an academic standpoint, rather than in the light of any specific data.

The Schoolhouse Commissioners of the City of Boston, acting with the School Committee, set aside an appropriation which enabled the writer, in conjunction with Dr. Thomas W. Harrington, to purchase apparatus and carry on a series of experiments covering a period of about three months, for the purpose of obtaining definite information upon the subject.

Briefly stated, the objects of the experiment were as follows:

First.—To find whether the mental and physical conditions of the occupants of a school are improved by increasing the relative humidity of the air in the rooms.

Second.—To determine at what point the relative humidity should be maintained, to ensure the greatest degree of comfort.

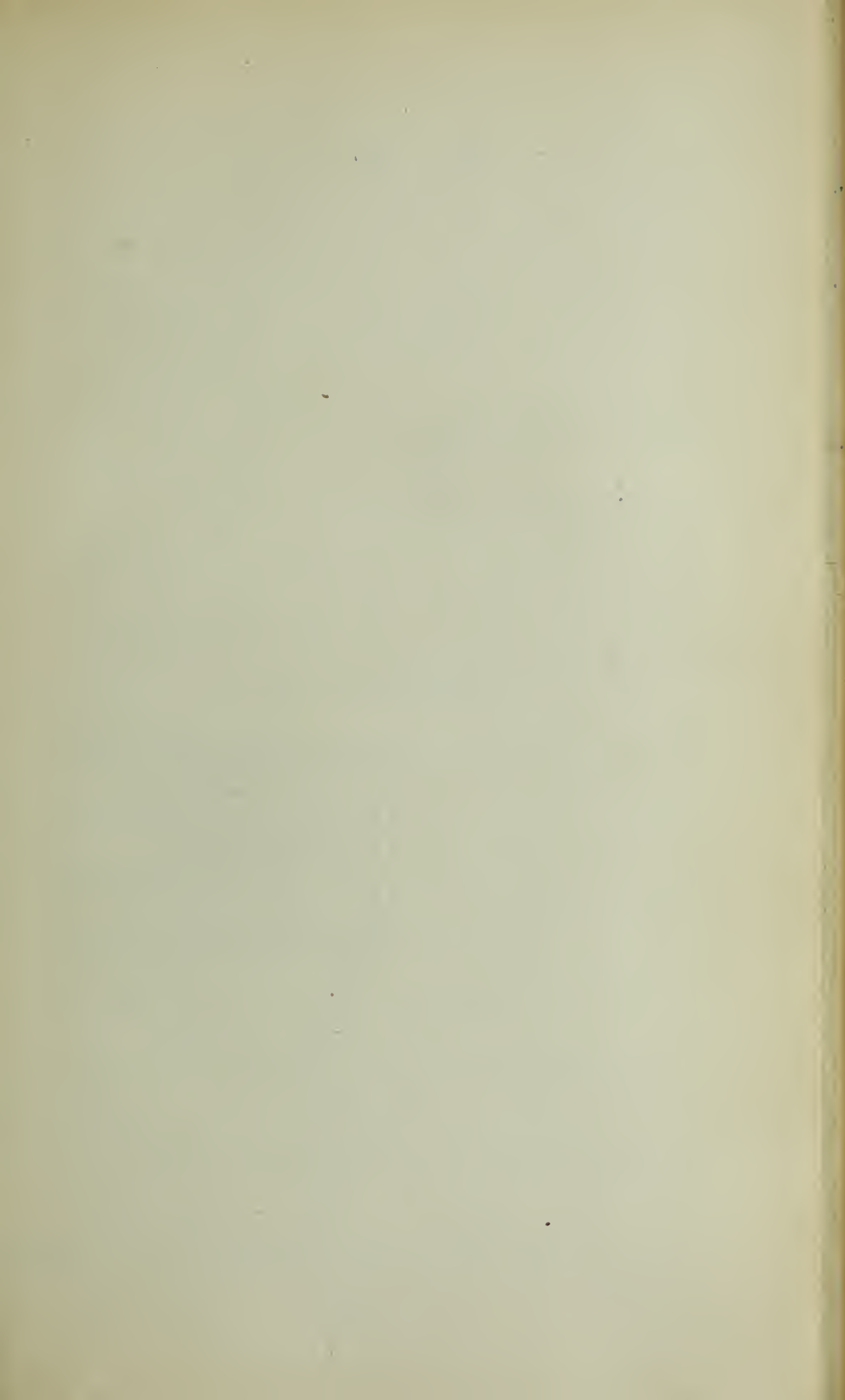
Third.—To find how much lower the temperature may be comfortably maintained when the relative humidity is increased.

Fourth.—To obtain a record of the humidity during the winter months of a school building when heated and ventilated in the ordinary manner, by means of a plenum system.

Fifth.—To see whether it is practicable to moisten the air by means of a system jet and keep the humidity within reasonable control.

In order to make a comparative study of the effect of increased humidity upon the physical and mental conditions, observations should be made upon children who live and move in the same walks of life, attend the same school and occupy similar grades.

The Oliver Wendell Holmes School was selected as being the best adapted for the purpose of conducting the tests. It contains twenty-four class-rooms beside a manual training



room and cooking room. On the basis of forty pupils per classroom it has a capacity of nearly 1,000 children. The building is of brick, three stories in height, of the so-called fireproof construction throughout. The floors and stairs are of reinforced concrete, all of the principal rooms having upper floors of hard wood laid on screeds. The partitions are built of terra cotta blocks and plastered. It contains a plenum system of heating and ventilation, the air supply to each half of the building being furnished by a steel plate fan. The classes are so arranged that corresponding grades of pupils occupy similar rooms in each half of the building.

The second floor plan shows very clearly the shape of the building, the arrangement of the rooms and the exposure. The third floor is similar, the assembly hall being two stories high. The space on the first floor corresponding to the hall is divided into class-rooms.

The arrangement of the heating and ventilating apparatus is outlined in the basement plan. Steam is supplied by two horizontal return tubular boilers to a low pressure steam engine, which is belt-connected to two single inlet 7-foot, steel plate fans, each furnishing air to one-half of the building. The engine exhaust is turned into the heating system and this is supplemented by live steam passing through a reducing pressure valve. The water of condensation is returned to the boilers by an automatic pump and receiver. The class-rooms and the assembly hall are heated and ventilated by warm air. Only the small administration rooms and corridors contain direct radiators. Fresh air is taken into the system through a hooded intake at the center of the building and is warmed by a primary heater of cast-iron indirect pin radiators. The temperature is maintained at a uniform point, varying from 60 to 70 degrees Fahrenheit, as the occasion demands, by mixing dampers operated by graduated action thermostats, one being placed in the air beyond the discharge from each fan as shown on the drawing. The air is conducted through galvanized-iron ducts on the basement ceiling to the foot of the risers leading to the individual class-rooms, where it is further heated to a temperature of 95 degrees Fahrenheit by supplementary stacks of indirect radiators, each under the control of a thermostat placed in the room.

The arrangement of mixing dampers and duct thermostat and the location of the supplementary heater and room thermostat are shown somewhat in detail on the sketch of humidifying apparatus. The warm air enters each class-room through an opening about 8 feet above the floor and the foul air is withdrawn by gravity through a vent outlet at the floor, both being situated along the same wall. These are shown on the second floor plan.

Before beginning the experiments, all the dampers and deflectors were so adjusted as to furnish an air supply to each room on the basis of 30 cubic feet per minute per occupant.

The relative humidity of the air supply to the north end of the building was raised by introducing moisture in the form of steam, while that of the south end remained in its natural state, separate. Readings were taken of the humidity and temperature of the air in the duct and of the class-rooms of each half of the building. The children of similar grades on the moist and dry side were subjected to similar mental tests, and a record was kept of both the physical condition and the percentage of attendance.

Owing to lack of space an air washer could not be installed in connection with the existing apparatus, without making too many structural changes, and the steam jet was found to be the only moistening device which could be economically applied. The accompanying sketch shows the essential details. Six $1\frac{1}{4}$ -inch pipes spaced an equal distance apart were suspended in front of the inlet of one of the fans. A single row of holes $\frac{1}{16}$ inch in diameter and 1 inch apart were drilled in each of the two outer pipes, the others having two rows similarly placed. The pipes were connected up in two groups in such a way as to equalize the flow of steam as nearly as possible. The supply pipe was connected to the main steam drum, taking steam at boiler pressure. This was partially throttled by a valve near the boilers, further reduction being made, as the occasion required, by the globe valve in the branch supply to each group of perforated pipes. The volume of steam issuing from the openings was regulated by a diaphragm valve operated by compressed air taken from the automatic temperature control system and controlled by a humidostat placed in the main warm-air duct. The exact location is shown on the basement plan. In order to prevent flooding of steam in case of failure of the air pressure, a reverse acting diaphragm valve was also installed. This valve was normally closed by means of a spring and opened when the proper air pressure was maintained on the system. A three-way cock placed in the air piping to the diaphragm top of the valve permitted its operation by hand. The apparatus could thus be easily started and stopped by manipulating the cock. The water of condensation which always formed when the apparatus was first turned on, and which would slowly collect during use, was drawn off through a lever-handle air cock at the bottom of each pipe and caught in the drip pan underneath.

Humidostats of three different makes were connected up to the air piping, shut-off cocks being installed to cut out any two of them as desired. The action of the instrument is somewhat similar to the thermostat and depends upon the change in shape of a piece of cross-grained hard wood, due to presence or absence of moisture. Two of them had a graduated action causing the control valve to slowly turn on or off the steam. The other was of the positive type and its effect upon the movement of the valve disc was very much like that of a positive thermostat upon a set of mixing dampers, viz., either completely

opened or closed, there being no midway position. There was either a full flow of steam or none, and the results were far from satisfactory. One of the other instruments, having a graduated action, gave excellent satisfaction, the curtain of vapor in front of the fan inlet being very uniform and changing gradually with the varying demand for moisture.

The method of adjusting the apparatus was as follows: The duct thermostat controlling the mixing dampers was set to keep the tempered air in the duct at approximately that desired in the class-rooms, viz., a dry bulb temperature of from 63 to 67 degrees Fahrenheit and extreme care was used to regulate it closely. The humidostat was then adjusted to maintain the desired relative humidity at this temperature. The temperature of the class-room and of the air in the duct where the control apparatus was located being the same, the relative humidity of the room would correspond to that in the duct. The supplementary heater had no influence upon the quantity of moisture introduced, as it was beyond this point.

When starting up in the morning it was found necessary to turn on the steam jet gradually, as the instrument would not at once assume proper control of the jet. If this was not done the rooms became very uncomfortable on account of excessive moisture.

Before beginning the experiments the water was drawn off completely from both the boilers, the piping was thoroughly blown off and fresh water introduced to prevent as far as possible any odor due to oil or foreign matter. Notwithstanding this, a slight odor, somewhat objectionable, was noticeable on first entering the class-room when the relative humidity was over 55 per cent.

In the basement fresh-air duct on each side of the building there were placed wet and dry bulb thermometers of a pattern similar to those in use by the Weather Bureau of the United States Government, and also a hair hygrometer. A tight-fitting glass door of ample size permitted the instrument to be read from the outside of each duct, eliminating as far as possible any exterior influences. Observations were taken each morning about ten o'clock, after the apparatus had assumed normal working conditions. The hair hygrometer was set daily to correspond to the readings obtained from the wet and dry bulb thermometers. This instrument was installed particularly for use by the janitor, as it indicated directly the humidity in per cent and enabled him to determine whether the apparatus was working properly.

In rooms 12 and 17 on the second floor, located respectively on the dry and moist ends, were placed recording hygrothermographs from which complete autographic records were obtained of the temperature and relative humidity, the charts being replaced weekly. Each instrument was securely mounted upon a wood shelf fastened to a standard which was screwed to the floor and guyed with wires and turn-buckles to prevent

vibration. It was necessary to place it about $6\frac{1}{2}$ feet above the floor to prevent interference by the pupils, and care was taken to locate it in such a position as not to be affected by the incoming fresh air. The rooms were alike in respect to outside wall and glass area, and as they had no direct sunlight during the day it was not necessary to take into account the effect of the sun's rays upon the readings.

On the third floor, in rooms 20 and 22, wet and dry bulb thermometers were placed similar to those described above. They were located on an inside wall near the inner corner of the room and at about the height of the hygrothermographs.

The test was started on January 3, 1912, and terminated on March 28. As stated above, readings of the various instruments of the fan speed and steam pressure were taken each morning, generally about 10.30, after the humidifying apparatus had assumed its normal working condition. The readings of the hygrothermographs were checked up by a sling psychrometer and a standard thermometer and the instruments readjusted if necessary. The class-rooms were warmed and ventilated by the fan system alone, no outside ventilating by opening windows being permitted.

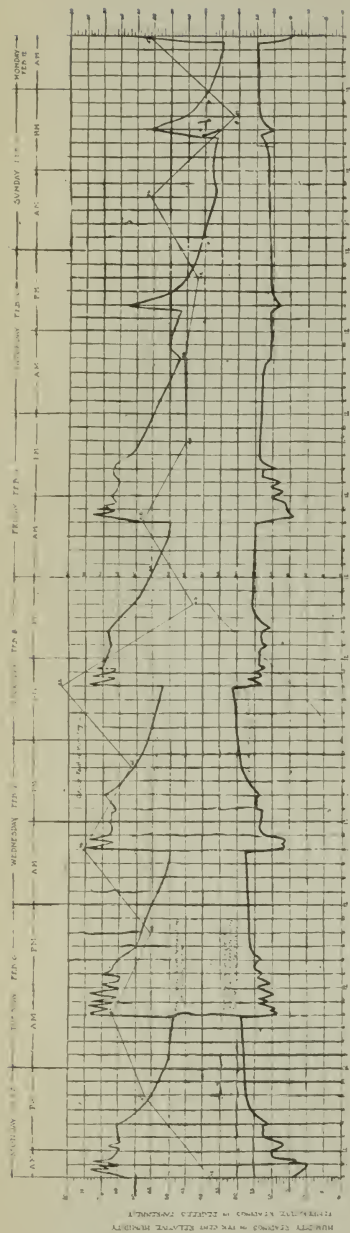
The average results for the months of January, February and March are given below. Those of the outdoor humidity were obtained from the United States Weather Bureau in this city, and taken at 8 a. m. daily.

AVERAGE READINGS FOR JANUARY, FEBRUARY AND MARCH, 1912.
Temperature and Humidity in Fresh-Air Duct.

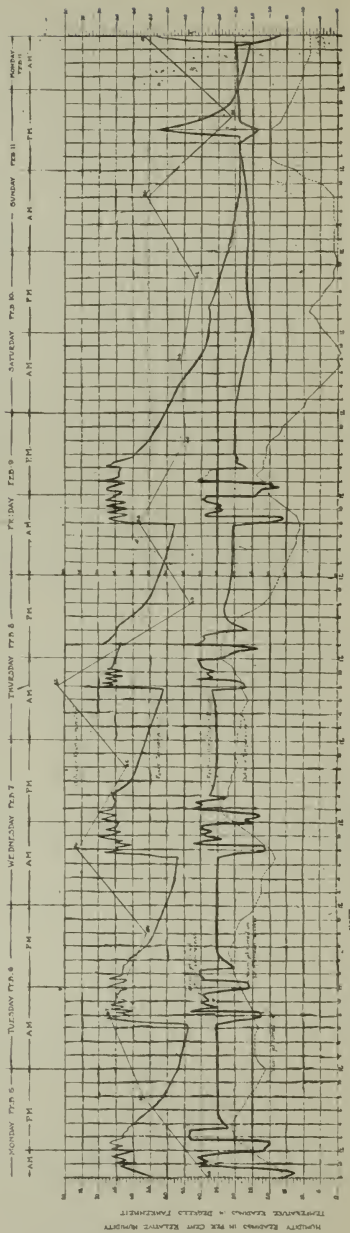
	MOIST END.			DRY END.		
	Dry Bulb.	Wet Bulb.	Relative Humidity, Per Cent.	Dry Bulb.	Wet Bulb.	Relative Humidity, Per Cent.
January.....	68.2 F	56.1 F	46	67.7 F	49.1 F	21.2
February.....	66.1 F	54.1 F	44.3	67.5 F	49.9 F	24.4
March.....	65.1 F	55.2 F	52.6	66.3 F	52.8 F	34.8

Temperature and Humidity in Class-Rooms 12 and 17 from Hygrothermographic Charts.

	ROOM 17, MOIST END.		ROOM 12, DRY END.	
	Temperature.	Relative Humidity.	Temperature.	Relative Humidity.
January.....	62.2 F	50.1 per cent	69.4 F	34.3 per cent
February.....	65.0 F	41.2 per cent	68.4 F	23.6 per cent
March.....	65.1 F	47.3 per cent	68.1 F	32.2 per cent



SOUTH END OF BUILDING - ROOM NO. 2 - DRY



O. V. HOLMES SCHOOL
BOSTON MASS
HUMIDITY TEST

ROOM NO. 2 - MOIST

CHART SHOWING TEMPERATURE & HUMIDITY READINGS IN CLASS ROOMS NO. 12 & 17

FEB 6 AM TO FEB 5 AM ALSO OUTSIDE TEMPERATURE, and HUMIDITY FOR NEARBY BUILDING READINGS

THIS CHART IS AN ENLARGED
REPRODUCTION OF A PROCTER-ENGINEERING RECORD

ROOM TEMPERATURE
ROOM HUMIDITY
OUTSIDE TEMPERATURE

Readings of relative humidity by means of a dry and a wet bulb

*Temperature and Humidity in Class-Rooms 20 and 22 from
Wet and Dry Bulb Thermometer.*

	ROOM 22, MOIST END.			ROOM 20, DRY END.		
	Dry Bulb.	Wet Bulb.	Relative Humidity, Per Cent.	Dry Bulb.	Wet Bulb.	Relative Humidity, Per Cent.
January.....	67.4 F	57.2 F	53.4	69.5 F	54.1 F	34.4
February.....	68.5 F	56.5 F	47.1	68.2 F	53.4 F	35.8
March.....	67.6 F	57.8 F	52.6	67.8 F	55.4 F	44.3

Outdoor Humidity.

	OUTDOOR HUMIDITY.	
	Day Reading, 8 a. m.	Night Reading, 8 p. m.
January.....	71.3 per cent	63.5 per cent
February.....	64.8 per cent	55.7 per cent
March.....	70.7 per cent	63.5 per cent

We have reproduced to much larger scale charts taken from the hygrothermographs in corresponding rooms on the moist and dry ends of the building for the week of February 5 to February 12, 1912, which represent the events taking place within the rooms during this period. For the purpose of comparison we have plotted the hourly readings of the outdoor temperature, and also the outdoor relative humidity from daily observations made at 8 a. m. and 8 p. m., both taken from the weather bureau records. The charts bring out very clearly the intimate relationship between temperature and humidity and it is perfectly evident that no system of air moistening will prove successful unless both the temperature and the humidity are under close and accurate control.

The chart of boiler pressures taken from the recording steam gauge, and covering the same period, is perhaps typical of the lack of care taken by some janitors in operating their boilers. Such a variation in steam pressure must necessarily affect the speed of the engine and the resulting air delivery to the rooms.

The diagram of indoor and outdoor relative humidities is not strictly accurate, the outdoor readings being taken at 8 a. m. while the others were made about two hours and one-half later. It is submitted to show the wide variation taking place out of doors and to bring out graphically the additional moisture introduced into the rooms on the wet side.

The average results of the experiments may be summed up as follows:

(a.) With the outside temperature ranging from 0 degrees to 10 degrees above, precipitation was observed on the windows in the moist end of the building when the humidity was 40 per cent and over. The teachers were inclined at the outset to raise some objections, but became accustomed to the conditions after a short time.

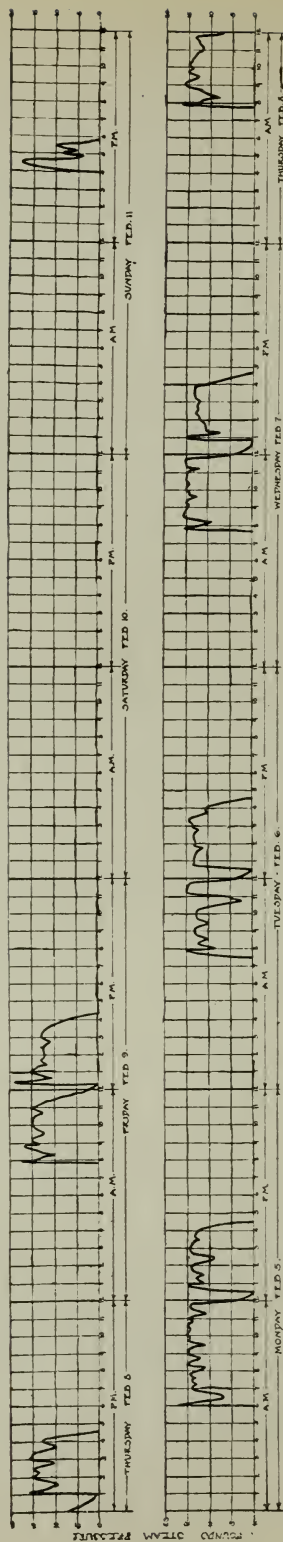
(b.) In the room on the north end of the building it was quite apparent that there was less body odor, so called, than on the dry end.

(c.) An increase in temperature of from 4 to 5 degrees was far more apparent on the moist side than on the dry.

(d.) Complaint was raised when the apparatus was first turned on each morning, of a very close and oppressive feeling in the rooms, and also an objectionable odor. Upon investigation it was found that the humidostat did not at once act upon the control device, and too much steam was introduced into the air, thereby raising the humidity far above the proper point. By checking the flow at the beginning this was almost entirely overcome.

Originally the room thermostats were mounted directly upon the slate blackboard, causing a decided overheating of the rooms Monday mornings, due to influence of cold walls upon the thermostats. This trouble was overcome to a certain extent by mounting the thermostats upon wood backs, thus insulating the metal from the blackboard. The cause for a cold building on Monday morning is very clearly shown if a moment's study is given to the reproduction of the hygrothermograph chart and the plot of boiler pressures. The latter indicates that steam was kept up only about eight and one-half hours each school day, none on Saturday and a little on Sunday afternoon. During the seven days practically three-quarters of the time no pressure was registered on the gauge. The curved lines of drop in temperature at night are very similar for the several periods of school session. On Saturday night, however, with the outside temperature hovering around zero, the room dropped below freezing, remaining so for a long period of time.

On Sunday afternoon the apparatus was started up with a corresponding rise in temperature, and the quick recovery on Monday morning showed that a sufficient amount of radiation had been provided to bring up the temperature of the air in the room. It is, of course, evident that a greater time must elapse before the walls, floors, ceilings and furniture become heated to the same degree. The teachers and pupils of this particular school have complained repeatedly of the discomfort arising from the cold floors and furniture on Monday. The remedy is to be found in disciplining the janitor, and there was a marked improvement each morning when the autographic evidence was submitted to the proper authorities. The moral



RECORD OF BOILER PRESSURE
 MONDAY FEB 5 RH TO MONDAY FEB 12 RH
 TAKEN FROM GAUGE OF RECORDING PRESSURE GAUGE

O. W. HOLMES SCHOOL
 BOSTON, MASS.
 HUMIDITY TEST

effects of a recording pressure gauge and a recording thermometer are invaluable in maintaining proper operation of heating plants.

(e.) While the heating apparatus in the average school may perhaps be operated a greater number of hours in the week than the one under discussion, nevertheless an ample factor of safety ought always to be used in figuring radiating surface to allow for quick heating in the morning.

The results obtained when humidifying the air by means of a steam jet lead us to the following conclusions:

First.— To secure the greatest comfort, the relative humidity should not exceed 55 per cent; somewhere between 45 and 50 per cent is probably the best range.

Second.— With the humidity at 55 per cent the temperature of the room should never rise above 65 degrees Fahrenheit. A temperature of from 61 degrees to 62 degrees will give better results.

Third.— Moistening the air up to 40 per cent or above should never be attempted unless both the heating system and the humidifying apparatus can be kept under close control. With a room temperature of from 70 to 75 degrees, and a relative humidity of 50 per cent, there is a very pronounced feeling of oppression and physical discomfort, as well as a perceptible odor which is disagreeable.

If the heating apparatus does not have automatic temperature control, the regulation being in the hands of the teacher or janitor, there will be many times when it will rise above 70 degrees. Under such conditions it is not wise to increase the humidity of the air much over 35 per cent, and we should be inclined to omit it altogether.

No system of air moistening will prove successful unless both the temperature and the humidity are under close and accurate control. A jet of steam blown into the incoming air without some forms of close regulation is at best a very crude affair. While the introduction of steam in moderate quantities may seem to the average layman to meet all of the requirements, it is of doubtful value, and when delivered in large amounts is liable to produce great discomfort.

Doctor Harrington submitted the following reports of the effect of increased humidity upon the mental and physical conditions of the pupils:

First.— On the basis of similar mental tests conducted upon pupils occupying similar grades on both the moist and dry sides of the building no appreciable difference was found.

Second.— The three rooms on the moist side had a percentage of attendance of 100. The percentage of attendance of all teachers on the moist side was 100; on the dry side the percentage of attendance of pupils was 97.

APPENDIX XI.

REPORT ON ELECTRICAL DIVISION.

IN GENERAL.

The following is a résumé of the major items of engineering and construction work done under the supervision of this division during the past year (February 1, 1912, to February 1, 1913).

Complete plans for 13 new buildings . . . \$78,588 00

Electric Lighting:

Shurtleff School	\$2,015 00	
Dillaway School	1,350 00	
Public Latin School	710 00	
Lawrence School	674 00	
George Putnam School	537 00	
Minot School	530 00	
Hugh O'Brien School	347 00	
Miscellaneous, 83 items	3,463 96	
		9,626 96

Industrial Apparatus:

Boston Industrial School for Boys,	\$3,127 44	
Dorchester High School	2,389 85	
Lewis School	696 00	
Quincy School	681 00	
Miscellaneous, 24 items	2,132 66	
		9,026 95

Fire Alarm Systems:

29 items	4,985 13
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Projection Apparatus:

Including reflectoscopes, wiring, curtains, etc.,	
31 items	2,912 66

Gas Appliances:

Lighting, heating and cooking, 49 items	2,112 97
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Vacuum Cleaning Systems:

Lewis School	\$1,330 00	
Charles Bulfinch School	406 00	
		1,736 00

Carried forward \$108,988 67

<i>Brought forward</i>	\$108,988 67
<i>Bells, Telephones, etc.:</i>	
20 items	1,711 19
<i>Furnishings:</i>	
42 items	946 00
<i>Electric Clocks:</i>	
4 items	81 66
 Total	 <u>\$111,727 52</u>

In addition to the above the division has furnished supervision and maintenance for the existing equipment, consisting of electric lights, clocks, bells, telephones, fire alarms, motors, vacuum cleaners, gas appliances, stereopticons, moving picture apparatus, etc., the approximate cost of which is \$12,710.59.

The organization of the division includes an electrical engineer, an assistant, two draughtsmen, one electrician on general repair work and a fire alarm inspector.

All work pertaining to the maintenance of the school fire alarm system and nearly all of the electric clock maintenance and the minor repairs to electric lights and telephones is attended to by the employees of the division, only the major items of repair work being sent out to contractors.

ILLUMINATION.

In the demand for improved lighting in existing class-rooms the past year has exceeded all previous records, due apparently, in part, to the unusually large number of dark and cloudy days and in part to the ever-increasing necessity of utilizing every possible moment of the school day in order to meet the study requirements. This demand, which in former years has been noticeable mostly among the upper elementary schools, has during the past year been noticeable among lower elementary schools as well.

On February 1, 1913, our records carried applications for electric lighting amounting to \$28,949.50, 77 per cent of which was required in class-rooms, the remainder being principally for assembly halls. Of this \$28,949.50, the Board, owing to lack of funds, finds itself able to grant only \$7,649.50, or 26 per cent of the amount applied for.

It is quite obvious that this demand for improved lighting will become more imperative with each succeeding year, therefore the following statement showing the magnitude of the undertaking may be of interest at this time.

(1.) The number of class-rooms now equipped with electric lighting is 1,707, which is 62.16 per cent of the total number, 2,746 (94 portable buildings not included).

**GRAPHIC REPRESENTATION AND TABLE SHOWING DECREASE IN COST
OF CLASSROOM LIGHTING WHICH HAS BEEN MADE POSSIBLE
THROUGH THE USE OF TUNGSTEN LAMPS.**

Year	Equipment per classroom.	Cost of current per kilowatt hour	Cost of renewal per lamp.	* Cost per room per hour, based on average life of "Mazda" lamps as being about 750 hours.
1907	24 50-watt plain carbon lamps.	10 cents	Free renewal	12. cents.
1908	9 60-watt "Mazda" lamps.	10 cents	\$1.10 to 90 cents	6.66 cents
1909	9 60-watt "Mazda" lamps.	10 cents	90 cents	6.48 cents
1910	9 60-watt "Mazda" lamps.	10 cents	90 to 55 cents	6.13 cents
1911	9 60-watt "Mazda" lamps.	10 cents	55 cents	6.06 cents
1912	9 60-watt "Mazda" lamps.	10 cents	55-45-35 cents	5.93 cents
1913	9 60-watt "Mazda" lamps.	10 cents	35 cents	5.82 cents

* Note that this decrease is due entirely to the diminished cost of production of the tungsten lamp, and not to any reduction in the price of current.

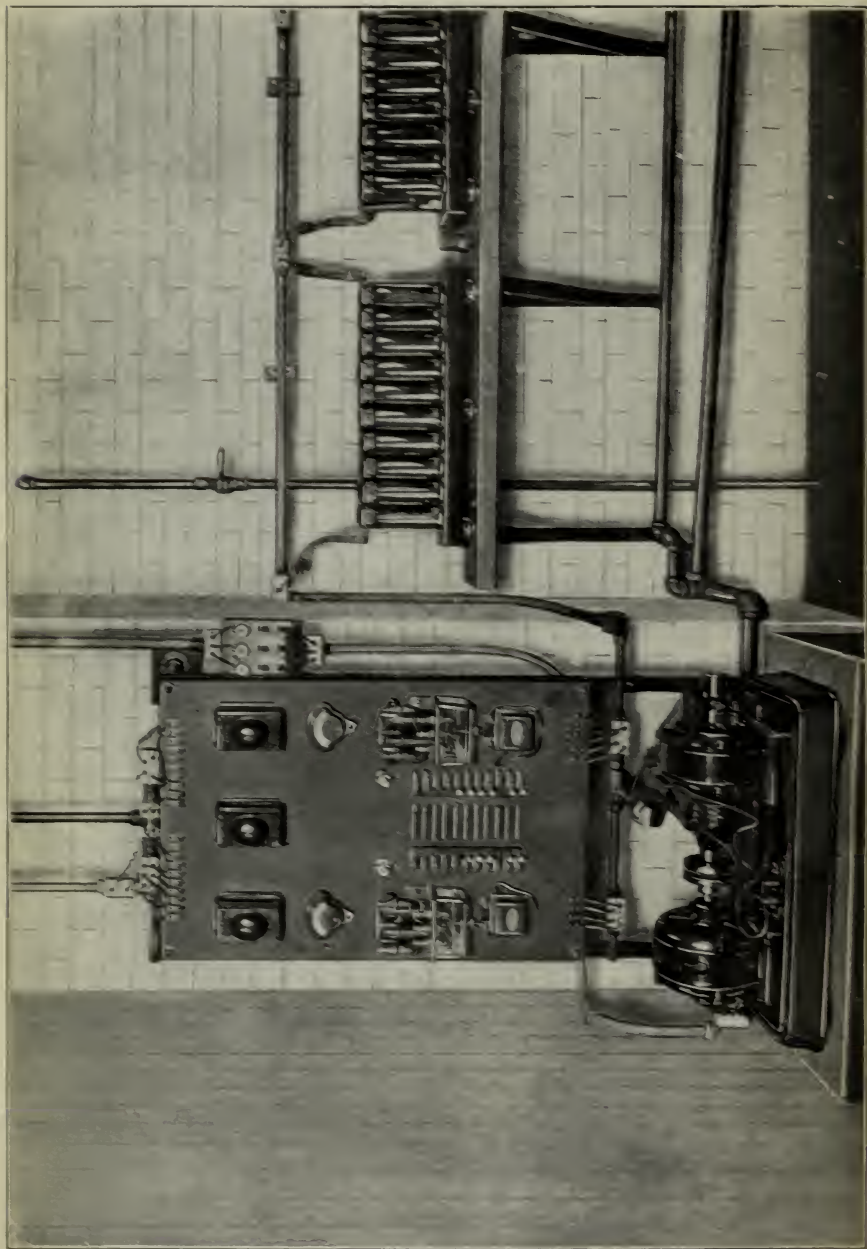


FIG. 1 — LOW-VOLTAGE SWITCHBOARD, MOTOR GENERATOR SET AND STORAGE BATTERIES, SOUTH BOSTON HIGH SCHOOL.

(2.) The subdivision of buildings equipped is as follows:

High schools, 460 rooms, 26.94 per cent.

Upper elementary, 823 rooms, 48.21 per cent.

Lower elementary, 424 rooms, 24.83 per cent.

(3.) The number of class-rooms not equipped with electric lighting is 1,039, which is 37.84 per cent of the total number.

(4.) The subdivision of buildings not equipped is as follows:

Upper elementary, 380 rooms, 36.6 per cent.

Lower elementary, 659 rooms, 63.4 per cent.

The lighting system developed by this department in 1907 and fully described in the yearly report of 1907-08, having been found most satisfactory to date, is the one in general use.

This system is now generally recognized as the standard schoolhouse system throughout the country.

The tendency toward the adoption of the later types of indirect lighting systems in commercial and other lines has been noted and the department has made a few experimental installations of this character, the physical results of which have been very satisfactory. The initial cost and the cost of operation, however, do not make a favorable showing as compared with the regular schoolhouse system previously described and for these reasons it is doubtful whether the city will feel that it can afford such a "luxurious" system.

In addition to the increased demand for class-room lighting, as previously noted, there has been a considerable amount of work necessitated by the extended use of school buildings for evening centers, lectures, concerts, etc. Moving picture and stereopticon equipments have been installed in the East Boston, Charlestown, South Boston and Roxbury High Schools, and a number of elementary schools have had additions made to their lighting equipment to make them available for public use.

SIGNAL SYSTEMS.

In the report of 1910-11 mention was made of the necessity for more efficient and reliable power units for operating clocks, bells, fire alarms, etc. Such a system has now been perfected and is illustrated in Fig. 1. This plant replaces 117 cells of primary battery, the average yearly cost of maintaining which was \$81.46. The cost of operation by means of the plant shown is \$36.60 per year, which price includes interest and depreciation.

The service rendered by these plants is also very much better than with the primary batteries formerly used. Seven plants were installed during the past year.

Fire Alarm.

One hundred and sixty-eight buildings are now equipped with the combination drill and auxiliary system, leaving twenty-six buildings still to be equipped. The funds provided for this season's work will reduce this number to eighteen.

There are also thirty buildings not yet provided with connections to the Fire Department, which number will be reduced to twenty-six on completion of this season's work.

The fire alarm system in each school is regularly and thoroughly inspected at intervals not exceeding thirty days, and in addition to these tests each system is used at least once a month for fire drill purposes.* Three genuine fires have occurred during the past year, viz., at the Sherwin, Roxbury High and Edward Everett Schools. In each instance the system proved entirely reliable and effective.

By arrangement with the Fire Department all fire alarm boxes on new buildings, and as many as possible of the boxes in existing buildings are now being placed outside of the schools, either on the outside of the building or on the pole or lamp post at the curbstone line. This makes many boxes heretofore available only to the occupants of the school now available to both the school and the general public. That the change has been of advantage to the public and to the Fire Department is shown by the fact that 115 alarms have been turned in from schoolhouse boxes in the twelve months covered by this report, twenty-two alarms being turned in from one box alone (Box 2123). An employee of the Schoolhouse Department inspects every box so used to see that the auxiliary connection to the school building with which the box is connected is properly reset.

VACUUM CLEANING.

In 1905 the Schoolhouse Department installed a vacuum cleaning plant in one of its new buildings. The system was not considered a success and nothing further was done in this line until 1910, at which time the attention of the Board was called to the progress which had been made in perfecting vacuum cleaning apparatus, particularly with reference to apparatus for cleaning bare floors.

A temporary plant was installed and connected to the piping in the building previously mentioned and was found to be a complete success.

The board then determined to make further tests with the object of determining the relative value of the various systems, of which there are many. With this object in view eight buildings have been equipped (two uncompleted) with systems furnished by five different firms, and their operation is being carefully watched. Two of the systems have been in use sufficiently long to prove that they will do what is required.

The others, while operating fairly well at present, have not been in use long enough to justify an opinion as to their merits.

Lack of suitable equipment for testing these plants has prevented the publication of any figures pertaining to efficiency or cost of operation, but it is expected that we will be able to give some definite figures in our next report.

Electrical Engineer.

* In some schools the fire alarm is used much more frequently, usually as an exit signal at noon or at recess time.

CITY OF BOSTON · SCHOOLHOUSE · DEPARTMENT ·

• SCALE OF DETAIL • 0 1 2 3 4 5 6 7 FT

• SCALE OF PLAN: 0' 1' 2' 3' 4' 5' 6' 7' 8' 9' 10' 11' 12' 13' 14' FT

• SCALE OF DETAIL: 0' 1' 2' 3' 4' 5' 6' 7' FT

• SCALE OF PLAN: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 FT

• SCALE OF DETAIL: 0 1 2 3 4 5 FT

DETAIL OF STOCK CASES

• DETAIL OF CLOTHES POLES USED WHEN
ALL SIDES OF WARDROBES ARE UTILIZED.

SECTION ·

ELEVATION · OF · DRESSER ·

ADJUSTABLE · SHELVES ·

GLASS ·

GLASS ·

WOOD ·

ALL · DRAWERS ·
TO · LOCK ·

SECTION ·

ELEVATION · OF · RECIPE · CASE ·

GENERAL STAND

FOR THE

WIND-DOOR-WATER



SECTION OF THE BUILDING

SHOWING THE INTERIOR

AND THE ARRANGEMENT OF THE



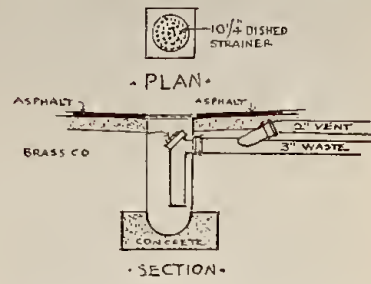
SECTION OF THE BUILDING

SHOWING THE INTERIOR

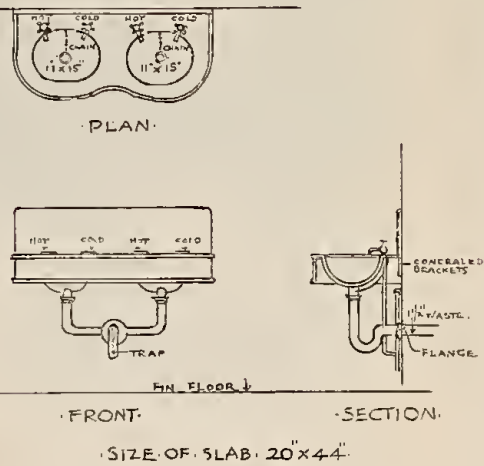
AND THE ARRANGEMENT OF THE

PLUMBING STANDARDS

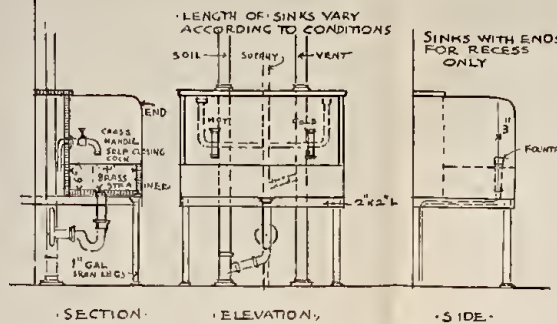
FLOOR WASH



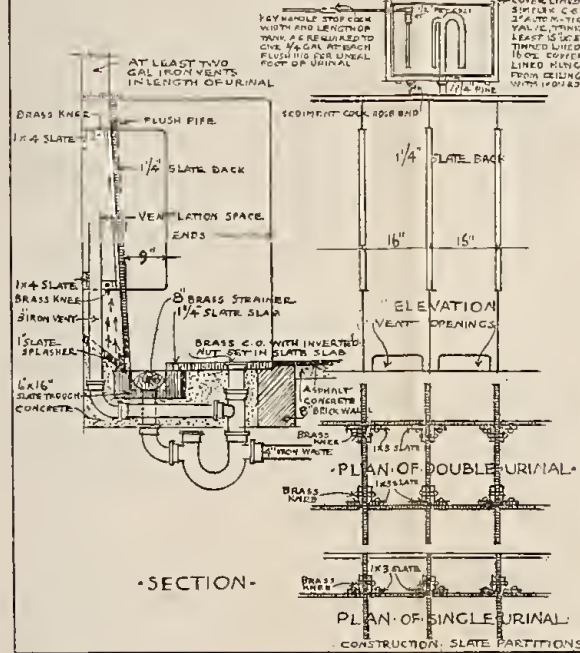
ENAMEL IRON LAVATORY BOWLS



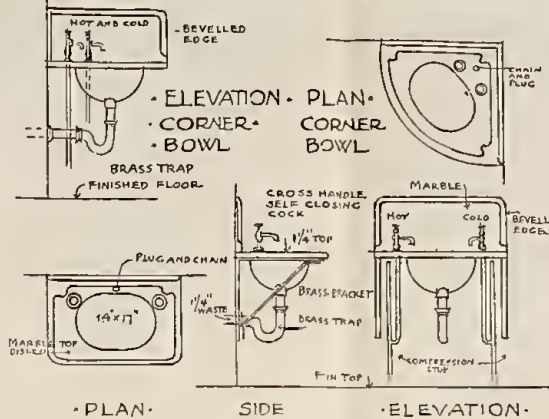
SLATE AND SOAPSTONE SINKS



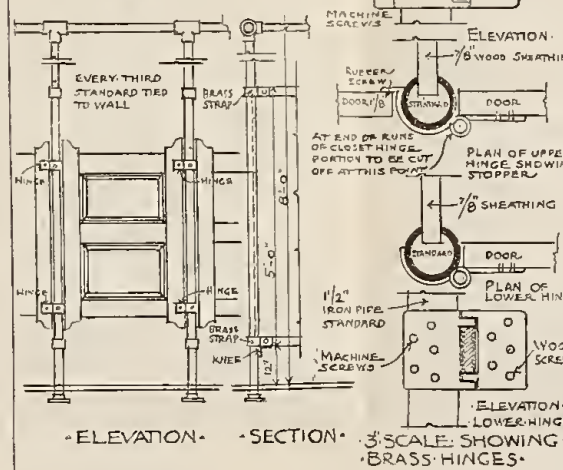
SLATE URINAL



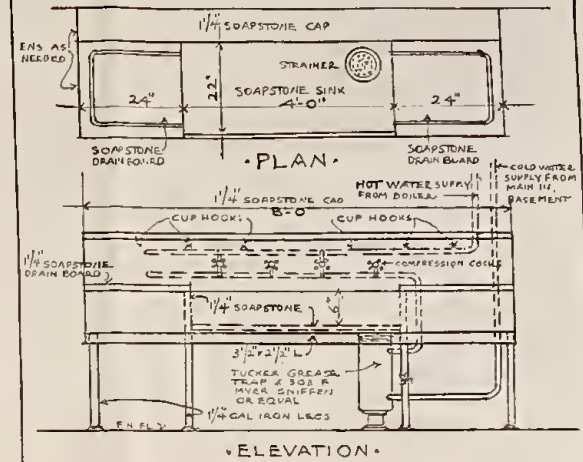
LAVATORY BOWLS



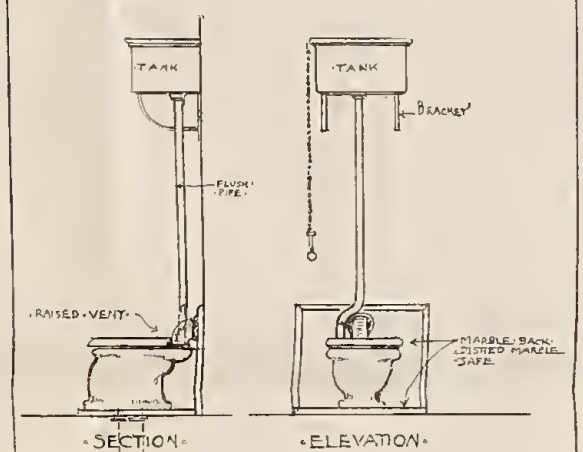
WATER CLOSET DOORS



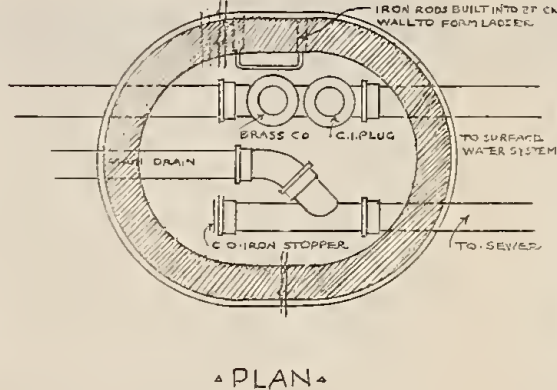
SOAPSTONE SINK COOKING ROOM



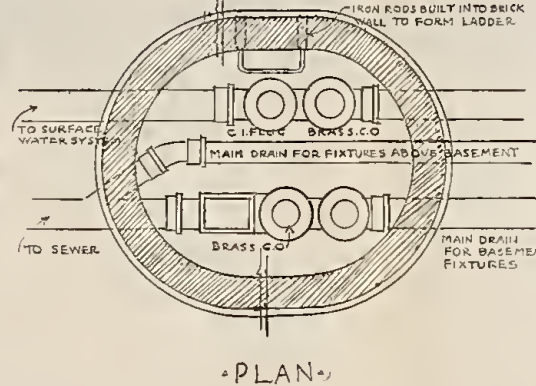
TEACHERS CLOSET



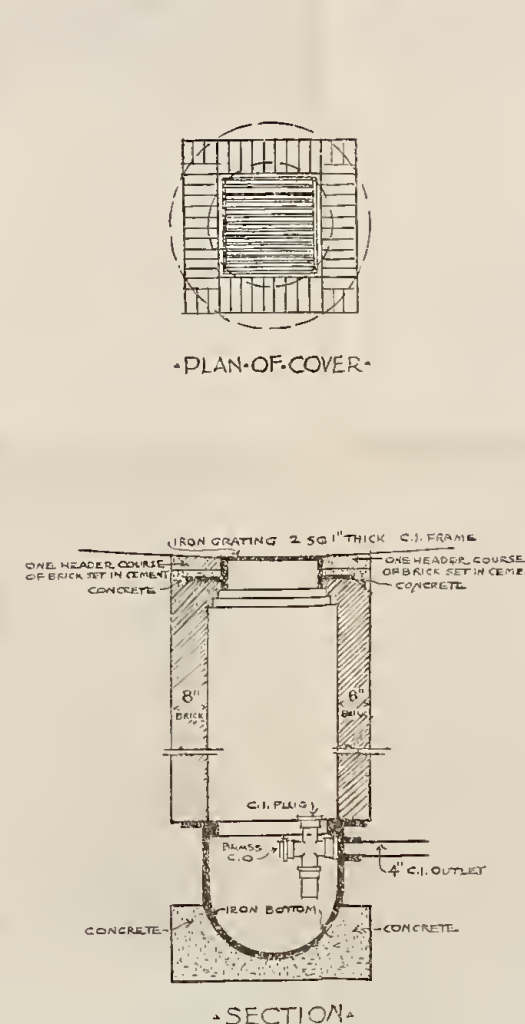
RUNNING TRAP



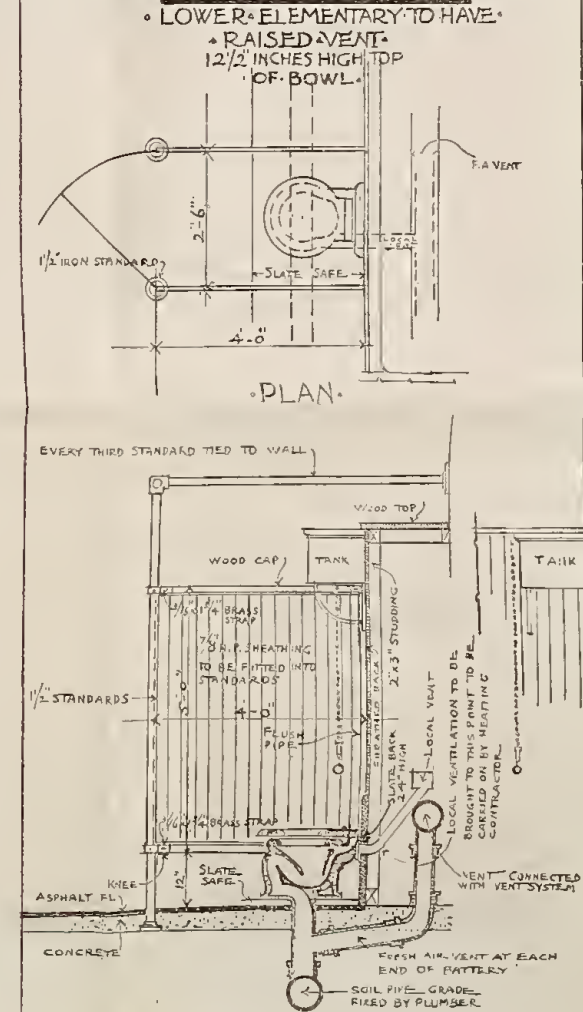
TIDE TRAP



CATCH BASIN



DUPILS CLOSET UPPER ELEMENTARY



MAN HOLE

CITY OF BOSTON

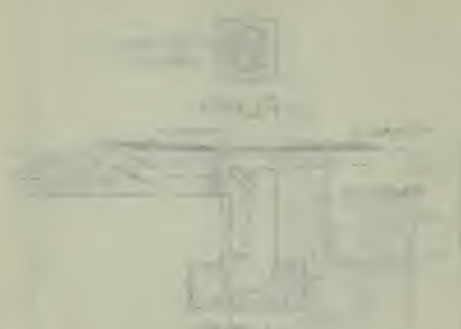
SCHOOL HOUSE

DEPARTMENT

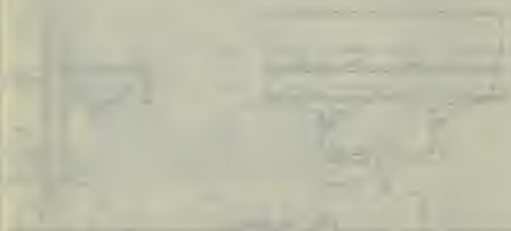
SCALE 0 1 2 3 4 5 6 7 8 FT.

DRAWN BY J. J. D. 1913.
CHECKED BY H. H. J. 1913.
APPROVED BY J. J. D. 1913.

12-11-1900



ENAMEL-IRON-
LAVATORY BOWL



SEE IN THE DRAWING

12-11-1900

HIGH.

SCHOOL.

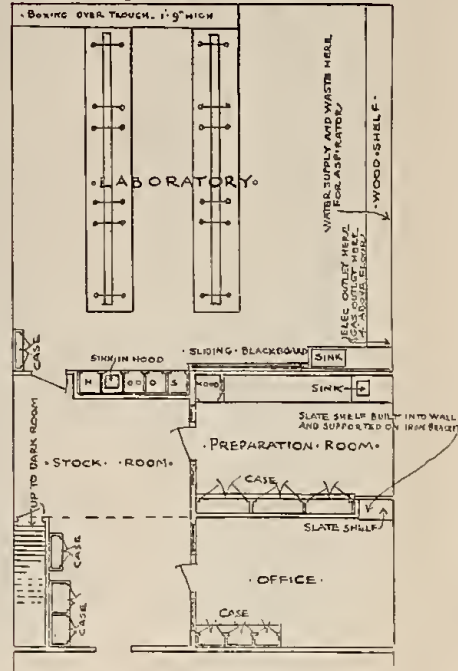
STANDARD.

FITTINGS.

CITY OF BOSTON.
SCHOOLHOUSE DEPARTMENT.

CHEMICAL.

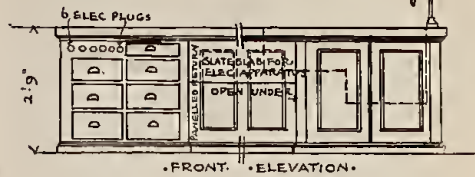
LABORATORY.



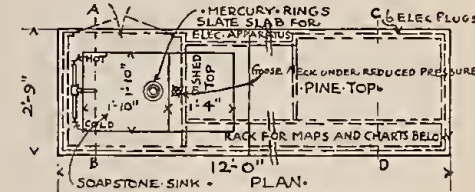
INSTRUCTORS TABLE.



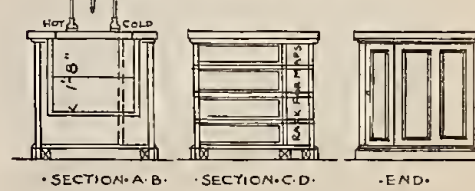
IN CHEMICAL.



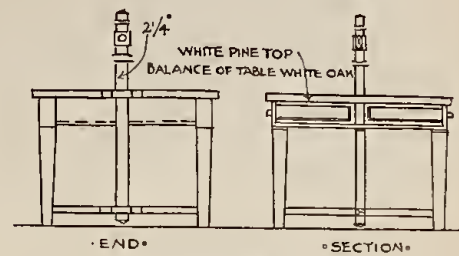
AND PHYSICAL.



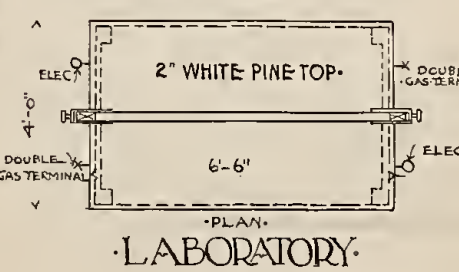
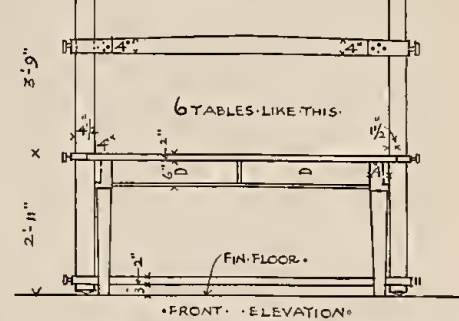
LABORATORIES.



PUPILS TABLE.



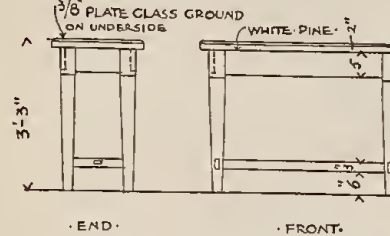
PHYSICAL.



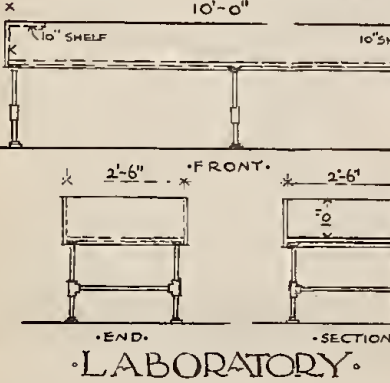
PUPILS TABLE AND MARBLE SINK.



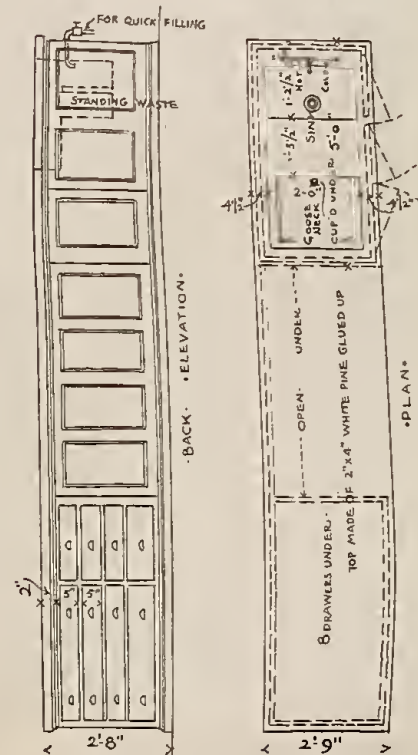
BOTANICAL.



AND ZOOLOGICAL.

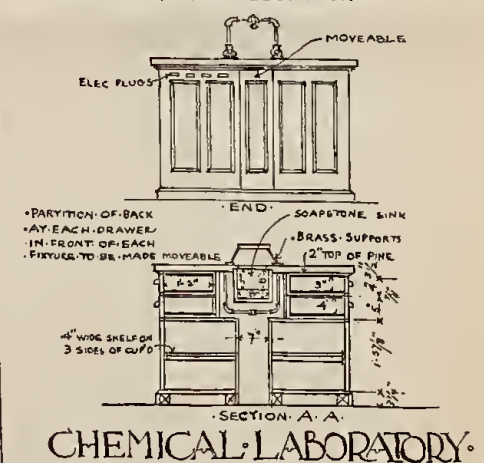
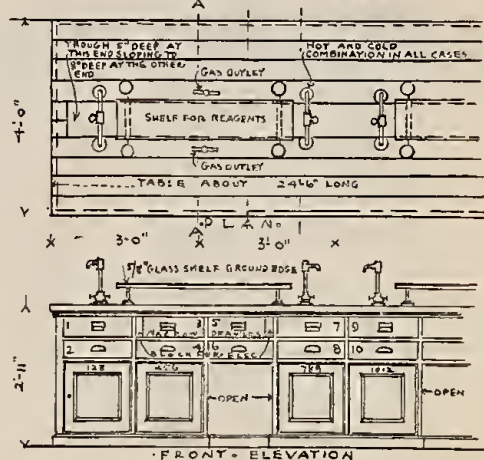


DEMONSTRATION TABLE.

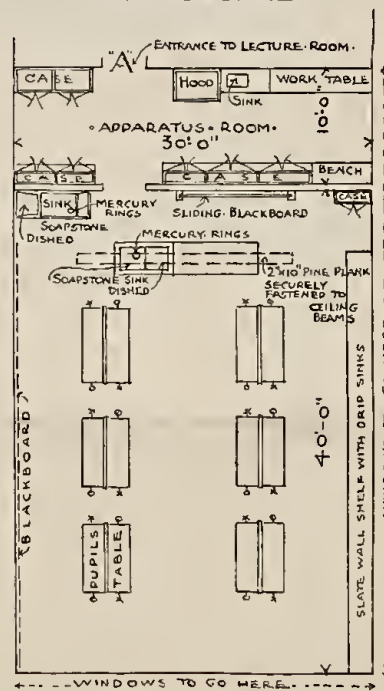


LECTURE ROOM.

PUPILS TABLE.

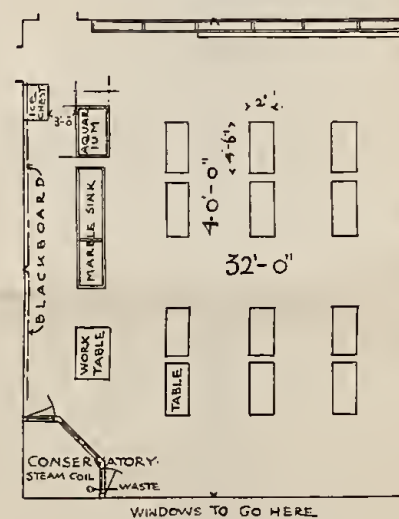


PHYSICAL.



LABORATORY.

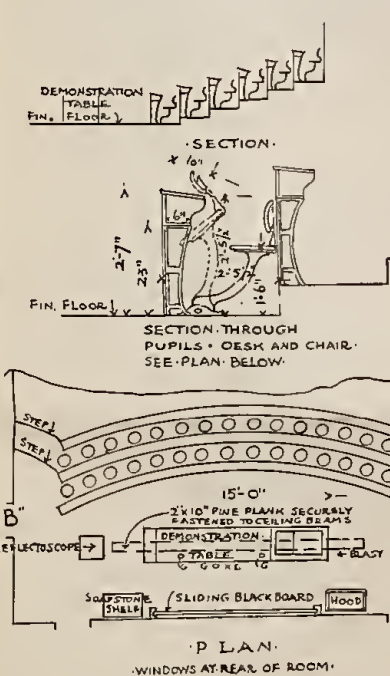
BOTANICAL AND ZOOLOGICAL.



LABORATORY.

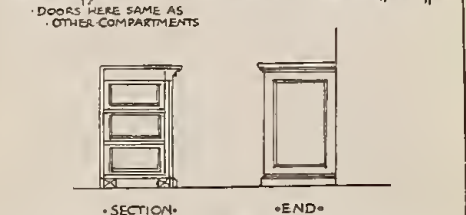
SOUTH EXPOSURE.

LECTURE.

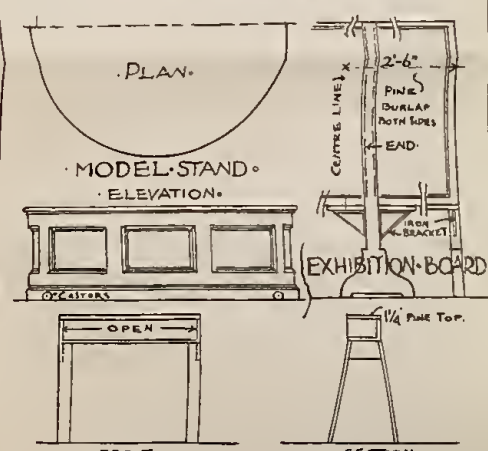


ROOM.

DRAWING ROOM.



CASE FOR DRAWING BOARDS.

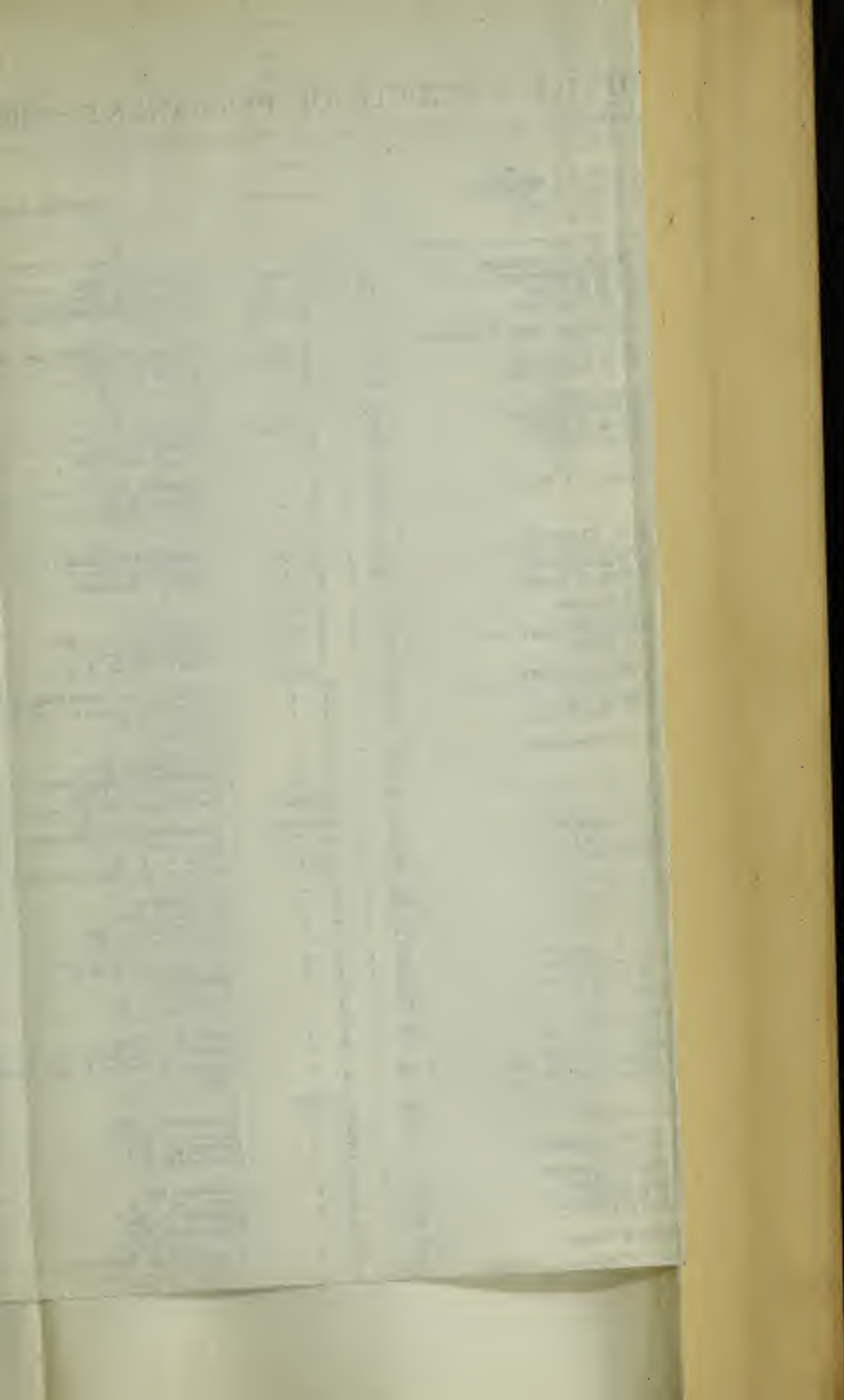


PUPILS TABLE.

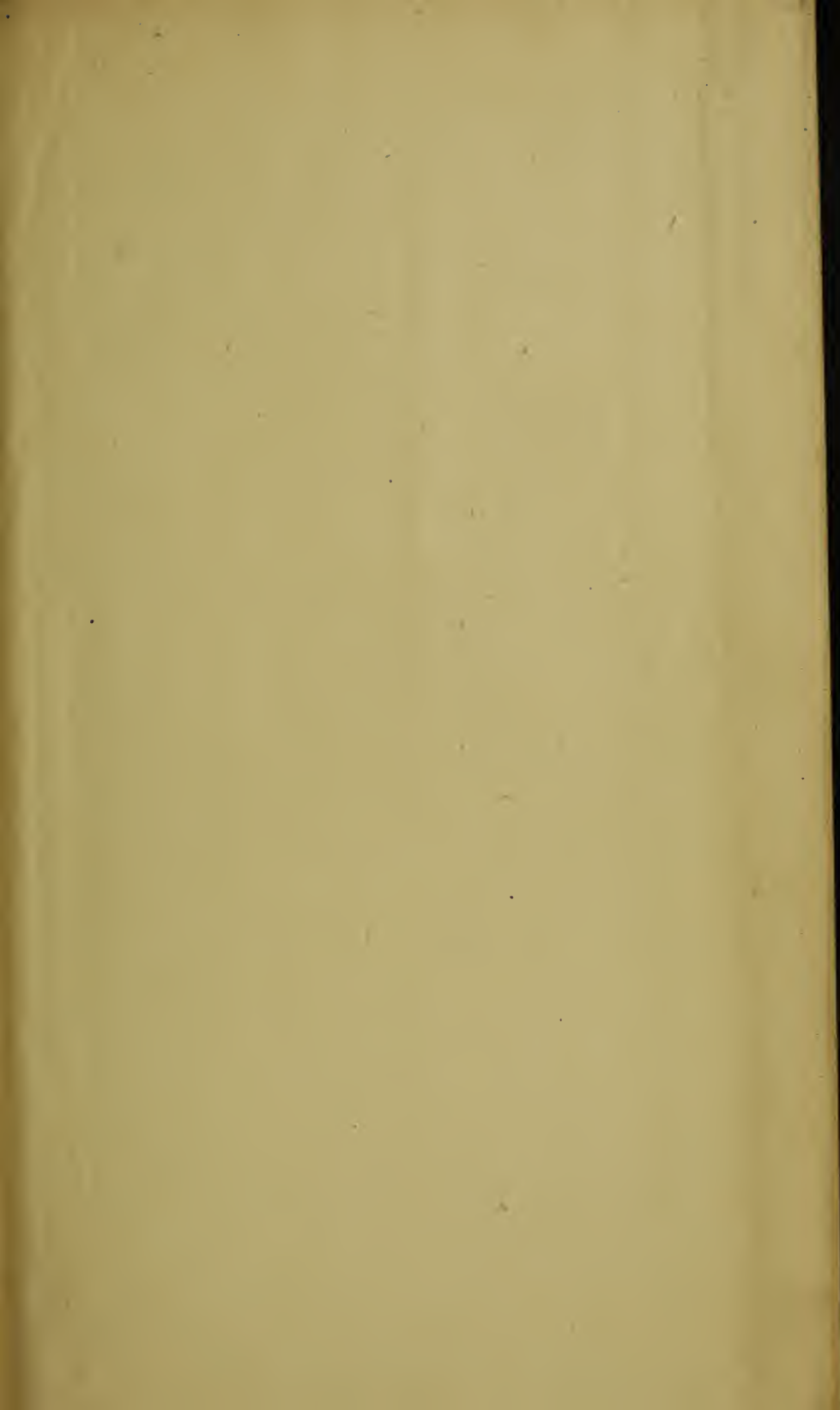
0 5 10 15 20 25 30 FT
SCALE OF PLANS.

0 5 10 FT
SCALE OF DETAILS.

APPENDIX XV.



2





AUG 8 1919

